A STUDY TO ASSESS THE EFFECTIVENESS OF INTRADIALYTIC STRETCHING EXERCISE ON MUSCLE CRAMPS AMONG PATIENTS UNDERGOING HEMODIALYSIS IN SELECTED HOSPITAL AT COIMBATORE

A DISSERTATION SUBMITTED TO THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILMENT OF REQUIREMENT FOR THE DEGREE OF

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BY

DIVIA ACHA JACOB

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APPROVED BY THE DISSERTATION COMMITTEE ON……..

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CERTIFIED THAT THIS IS THE BONAFIDE WORK OF

DIVIA ACHA JACOB

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SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT

FOR THE DEGREE OF **MASTER OF SCIENCE IN NURSING**

TO THE TAMILNADU DR. M.G.R. MEDICAL UNIVERSITY,

CHENNAI,

COLLEGE SEAL:

Prof. Dr. SHYLA KAMALA KUMARI, M.Sc (N),PhD,

PRINCIPAL,

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COIMBATORE.

DEDICATION

I dedicate this book to ***God Almighty***

who blessed me to finish this work successfully.

I dedicate this book to my lovable parents

Dr. Jacob George *and* ***Mrs. Usha Jacob*** *to my beloved sisters*

Sr. Eunice *and* ***Deena lusia Jacob*** *and beloved honorable*

Father ***Remban. Israel Samuel***

who helped me a lot throughout the moulding of this dissertation.

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Ms. Indu, Ms. Deepa Shalini, And Ms. C. Chandni

who stood with me when I'm in need of their help.

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"I will give thanks to the LORD because of his righteousness and will sing praise to the name of the LORD Most High."

Psalm 7:17

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ABSTRACT

Renal failure is an important non-communicable disease that affects world population including India. The prevalence of End Stage Renal Disease is rising throughout the developed and developing countries. The main aim of this study was to evaluate the effectiveness of intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis in a selected hospitals at Coimbatore.

The objective of the study was to assess the level of muscle cramps among patients by using Modified Brief Pain Inventory Scale to evaluate the effectiveness of intradialytic stretching exercise on muscle cramps among patients in interventional group and to find out the association between the post test level of muscle cramps in interventional and control group with their selected demographic variables. The conceptual framework used for this study was based on Modified Katherine Kolcaba Theory (2001).

A quasi experimental pre and post test with control group design was used in this study. 60 sample were selected by using non probability purposive sampling technique. Intradialytic stretching exercise was given for interventional group. Data was collected before and after intervention by using Modified Brief Pain Inventory Scale. The study finding showed that the obtained 't' value was 16.29, 15.72, 23.83, 12.03, 18.42. It was significant at $p<0.05$ level. It shows that the Intradialytic stretching exercise was effective to relieve the muscle cramps among patients undergoing hemodialysis.

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CHAPTER I

INTRODUCTION

You can't avoid pain, but you can choose to Overcome it.

Paulo Coelho..

Background of the Statement:

The state of health is attained by the proper balance in homeostasis mechanism around the internal and external environment of the human body. The harmonious relationship in human body depends on proper functioning of every organ and their unique function. In that specifically, the continuous function of kidneys has a greater impact on attainment of fullest level of health.

Kidneys - the vital organ plays a main role in the maintenance of homeostasis mechanism in human body. Healthy kidneys are the sophisticated reprocessing machine that cleans the blood by removing fluid, salt and wastes from the body. Deficit in blood supply to the kidney will lead to decreased function. Prolonged decrease in the blood supply or in the blood pressure will lead to acute or sudden kidney failure.

Different kidney pathologies challenge these functions and put human life in danger. Two such important pathologies are acute and chronic renal failure. George Hass of Germany had the vision and courage to risk everything in search of the answer for treating renal failure and the first clinical dialysis on a uremic man was

performed in the year of 1924 October. When function of the renal is suddenly declining, the nephrons are over worked and renal failure may develop.

Renal failure is an important non communicable disease that affects the world population including India. Renal failure is characterized by progressive destruction of renal mass with irreversible sclerosis and loss of nephrons over a period of at least few months to years, depending upon the underlying etiology. Renal failure is classified into two; they are acute and chronic renal failure.

Acute Renal Failure (ARF) is a rapid decrease in kidney function leading to collection of metabolic wastes in the body. When the Glomerular Filtration Rate (GFR) decreases Blood Urea Nitrogen (BUN) level increases, waste products build up in the blood causing uremia and azotemia. This acute syndrome may be reversible with prompt intervention. ARF may lead to Chronic Renal Failure (CRF).

According to American Society of Nephrology (2005), review of discharge data on a projected total of 29,039,599 hospitalizations identified 558,032 cases of ARF, with a frequency 19.2 per 1000 hospitalization.

Lameire N & Biesen WV stated that the ARF remains one of the most enigmatic syndromes in nephrology, with reported incidence rates varying from 0.9 to 20% and mortality rates between 25 to 80%.

CRF is a common clinical syndrome characterized by decline in glomerular filtration, perturbation of extracellular fluid volume, electrolyte and acid base homeostasis and retention of nitrogenous waste from protein catabolism. Chronic renal failure (CRF) results from partial or total loss of renal function. It exists when

residual renal function is less than 15% of normal. Renal failure can be treated by dialysis. There are two types of dialysis namely Hemodialysis and Peritoneal Dialysis.

According to WHO (2012), global burden of CRF is approximately 11,010,107 and 850,000 deaths per year. In India, the incidence and prevalence of CRF to be 0.79% or 7852 per million/ population and the incidence of ESRD is based on 572,029 subjects residing in the city of Bhopal (2008) reported from the journal of American Society of Nephrology.

According to the first report of the Indian CKD registry, almost more than 2.5 lakhs people die of renal failure in India every year. Journal of Renal care association (2005) reported that the prevalence of CRF patients in Tamil Nadu 0.47% (0.30% - 0.76%).

Dialysis is one of the main replacement therapies in patients with renal failure. It removes many of the toxins responsible for the uremic syndrome and prolongs survival. However, dialysis treatment doesn't fully cure the uremia. During Dialysis many complications may occur like tiredness, fatigue, hypotension and muscle cramps.

European Dialysis and Transplant Nurses association (2010) reports that 10, 65,000 people are undergoing hemodialysis in worldwide.

Journal of BMC Nephrology (2010) reported that the dialysis extrapolated prevalence is about 1,125,740 estimated Population. In India, renal care including dialysis is supporting thousands of patients with kidney failure.

In South India, 500 patients register for hemodialysis each year (health management centre, 2005).

Need for the study:

Dialysis is a process whereby the solute composition of a solution. It is altered by exposing solution, through a semi permeable membrane. During dialysis many complications occur including hypotension, fatigue, tiredness, muscle cramps etc.. One of the main complications which affect the activities of the person is severe muscle cramps.

According to Indian Journal of Nephrology (2014), approximately 9-13% of patients on hemodialysis in India die within 1 year.

Jean L (2010) stated that muscle cramps is a common complication of hemodialysis treatment, occurring in 33 to 86 percent of patients ; they often result in the early termination of hemodialysis session and are therefore a significant cause of under dialysis. A cramp is a prolonged involuntary muscle contraction that occurs in a muscle that voluntarily contracts when it is already in its most shortened position. The increased frequency of cramps at rest and during the night may be caused by the placement (by the plantar-flexed foot) of the calf and ventral foot muscles in the most shortened and vulnerable position during sleep. The exact etiology of cramps in dialysis patients is unknown. Since cramps tend to occur most frequently near the end of hemodialysis treatment, changes in plasma osmolality and/or extracellular fluid volume have been implicated.

Muscle cramps (involuntary muscle contraction associated with pain) occur frequently in patients receiving hemodialysis. Muscle cramps can involve the legs, most commonly in the feet, but can also involve arms and hands, as well as abdominal muscles. It is estimated that 33% to 86% of patients receiving hemodialysis have experienced muscle cramps. In a study conducted by Farajzadegan (2001), it was

found that about 25% of patients undergoing hemodialysis reported two or more cramps weekly.

Since cramps are a common intradialytic event, the discomfort leads to premature termination of the treatment, non compliance with the prescription and therefore under dialysis. Thus interfering with the muscle cramps and even preventing the occurrence become a major responsibility of the patients. Since nurses are taking care of hemodialysis patients almost everywhere, it becomes predominantly the nurses role.

Lee (1999) quoted in Dialysis and Transplantation journal that in a specific study involving 14000 hemodialysis treatments on 103 patients, the cumulative incidence of cramps was estimated to be 86%.

Magda Mohamed et al., (2007) conducted a study at Assiut University, Egypt on impact of stretching exercise protocol on reduction of muscle cramps during hemodialysis among CRF patients. Quasi Experimental research design was used. The sample size was 60 patients with muscle cramps during hemodialysis. They were instructed to perform stretching exercise and the result revealed that there was an improvement in patients knowledge and practice with regard to exercise, number of performance etc. after exercise. Finally the study recommended that, dialysis patients need appropriate intervention to relieve muscle cramps.

There are many uses of complementary therapies to reduce muscle cramps and it is becoming a significant part of modern day health care with millions of treatments taking place every year. The most used non pharmacological therapies are stretching exercise, strengthening exercise and oil massage.

Hansen (2005) stated that muscle cramps are prolonged involuntary muscle contraction. One must passively stretch the contracting muscle. Prophylactic stretching of the particular muscle can also prevent attacks.

There are 30 nephrology hospitals in Coimbatore, approximately more than 2000 renal transplantations done in a year, more than 15,000 dialysis done per week. Sree Abirami hospital is one of the best Nephro-Urology hospitals in Coimbatore. It is a 300 bedded multispecialty hospital having dialysis unit with hi-tech facilities. This has been awarded as "Wellness in kidney care" and an ISO Certified (1901-2008) tertiary hospital. About 30 to 40 kidney transplantations are done every year. SAH does nearly 1080 dialysis per month and 20-25 patients are dialyzed in a day, out of which 90% are Chronic Renal Failure patients.

The investigator during her clinical experience in the dialysis unit of Sree Abirami Hospital observed that most of the CRF patients experienced muscle cramps especially during hemodialysis. Thus the investigator has opted to provide passive calf stretching exercise during hemodialysis to relieve or prevent muscle cramps.

Statement of the Problem

A study to assess the effectiveness of intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis in selected hospital at Coimbatore.

Objectives of the Study

1. To assess the level of muscle cramps among patients undergoing hemodialysis in interventional group and control group.
2. To determine the effectiveness of intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis in the interventional group.

3. To find out the association between the post level of muscle cramps among patients undergoing hemodialysis in both the group with their selected demographic variables & clinical variables.

Hypotheses

H_1: There is a significant difference in the level of muscle cramps among patients undergoing hemodialysis in the interventional group and control group.

H2: There is a significant difference in the level of muscle cramps before & after stretching exercise among patients undergoing hemodialysis in the interventional group.

H3: There is a significant association in the level of muscle cramps among patient undergoing hemodialysis in both the groups with selected demographic variables & clinical variables.

Operational definitions

Effectiveness

Effectiveness refers to outcome of intradialytic stretching exercise in terms of reducing muscle cramps undergoing hemodialysis as assessed by Modified Brief Pain Inventory scale with scores ranging from 0 to 10 denoting the levels of pain as no cramps to unimaginable pain.

Intradialytic Stretching Exercise

It refers to passive stretching of the gastrocnemius and soleus muscles of the patient with muscle cramps undergoing hemodialysis by alternate dorsiflexion of the ankle with knee extension and flexion of the ankle, after which the ankle is inversed and eversed. This exercise is done for 60 times within 10 minutes and each time the position is maintained for 20 seconds.

Muscle Cramps

Painful involuntary spasms of either one or both the calf muscles of patients undergoing hemodialysis.

Hemodialysis

It refers to the process to the removing the impure blood via patient's artery, which is then passed through the dialyzer (artificial kidney) and the purified blood gets re-administered to the patients via vein.

Assumptions

- Hemodialysis results in electrolyte imbalance in muscles and hence cause muscle cramps.
- Calf muscle exercise improves tissue perfusion among gastrocnemius and soleus muscle thereby reduce muscle cramps.

Delimitations of the Study

This study is limited to

- a period of 6 weeks
- a sample size of 60
- only patients having muscle cramps undergoing hemodialysis.
- Stretching exercise of calf muscles only.
- patients in Sree Abirami Hospital coming for hemodialysis
- assessment done by Modified Brief Pain Inventory Scale.

Projected Outcomes

- The study will enable to identify the level of pain among patients with muscle cramps.
- The finding of the study will help the nurses to understand the importance of stretching exercise in pain reduction among patients undergoing hemodialysis.
- The study will provide opportunity for nurses to practice stretching exercise which will reduce the muscle cramps.

CHAPTER II

REVIEW OF LITERATURE

The task of reviewing research literature involves the identification selection, critical analysis and written description of existing information in the topic of interest. In this chapter, an attempt has been made to bring out the available literature which helped in projecting the widened perspective of the study.

According to Polit and Hungler (2004), review of literature is a critical summary of research on a topic of interest, often prepared to put a research problem in the context.

According to B.T. Basavanthappa, review of literature is defined as a broad comprehensive in- depth, systematic and critical review of scholarly publication and unpublished scholarly print materials. These publications were the foundation to carry out the research work.

This chapter deals with the collected information relevant to the present study through the published materials. These publications were the foundation to carry out the research work.

1. Literature related to muscle cramps.
2. Literature related to stretching exercise.
3. Literature related to the effectiveness of stretching exercise on muscle cramps.

Literature Related To Muscle Cramps

Chatrath H, et.al (2012) conducted a study on association of prevalence and morbidity with muscle cramps in patients during hemodialysis session. Sample size was 150 adult patients with muscle cramps who were selected by consecutive sampling technique. Cramps questionnaire and visual analogue scale were used to measure the muscle cramps. The result showed that 67% had muscle cramps during dialysis and this study concluded that the muscle cramps is associated with muscle cramps.

Murtagh EM (2012) conducted a systematic review of 59 studies to determine the prevalence of symptoms in ESRD undergoing dialysis. The results showed that 71% was the weighted mean prevalence of muscle cramps. ESRD patients on dialysis, experienced multiple symptoms, but one of the major symptoms is muscle cramps.

Stewart WK, Fleming LW (2010) conducted a study on muscle cramps during maintenance hemodialysis. In this study out of 397 patients who underwent dialysis, 195 developed muscle cramps due to low sodium fluid(49%) compared with only 131 had muscle cramps out of 563 dialyses with high sodium fluid(23%). This study concluded that the cause of muscle cramps was plasma volume contraction.

Kafkia T (2014) conducted a study on assessment and management of pain in hemodialysis patients at cryptus. In this study 70 renal patients on hemodialysis were the subjects. Their pain levels were assessed using visual analog scale and Wong baker pain scale and McGill pain questionnaire. Around 46% of subjects pinpointed internal pain in the legs, which they were managing either with they

were managing either with warm towel, massage or painkiller. It was concluded through this study that pain is affecting the everyday life of renal patients.

Ahsan Muhammad, et al (2004) conducted a study on effectiveness of systemic compression devices (SCD) on muscle cramps among 4 hemodialysis patients. Systemic compression devices were applied before each hemodialysis session on both legs and compression applied at 40 mmHg during treatment. Result showed that all the patients reported complete resolution for muscle cramps during dialysis period. The study concluded that SCD can be used to prevent lower extremities muscle cramps during hemodialysis session.

Brass EP (2002) conducted a study to find out the association of peripheral artery disease (PAD) with intradialytic cramps in patients undergoing hemodialysis at USA. Sample size was 122 selected from two separate dialysis centers. Ankle Brachial index (ABI) was used to determine PAD and medical record used to assess intradialytic cramps. The result showed that 52.1% of patients reported cramps during dialysis and had associated with PAD. This study concluded that there is an association between PAD and intradialytic muscle cramps.

Davison NS (2003) conducted a prospective cohort study the prevelance, causes, severity and management of pain. Sample size was 205 Canadian hemodialysis patients. The pain was assessed by Brief Pain Inventory Scale followed by McGill pain questionnaire method. The result showed that, 103 patients reported pain during dialysis and there reported were undergoing hemodialysis therapy longer (52.2 months) than their subjects who reported no

pain (37.7 months). The study concluded that the pain is a significant problem in more than 50% of hemodialysis patients.

Literature Related To Stretching Exercises

Susan Heiwe (2012) conducted a phenomenographic study on patients perspectives on the implementation of intradialytic cycling at Stockholm, Sweden. 8 samples were selected for this study using purposive sampling technique. The subjects did 30 minutes of intradialytic cycling at an intensity of 13-15 minutes. The study revealed that the implementation of intradialytic cycling was experienced as positive. Hence identification of motivators in direct care is important to improve the standards of intradialytic cycling.

Mika L Nonoyama (2010) conducted a prospective longitudinal study on exercise program to enhance physical performance and quality of life of older hemodialysis patients at Toronto. The objective of the study was to evaluate the feasibility of implementing a combined in-hospital and home based exercise program in older hemodialysis (HD) patients at a university hospital. A convenience sample of 9 older patients (>55 years) undergoing hemodialysis underwent an individualized exercise and strength exercise and patient education. The study concluded that the exercise program and the outcome measures were feasible for the old hemodialysis patients.

Weldon S.M (2003) conducted a study to evaluate the efficiency of stretching for prevention of exercise related injury. Randomized clinical trials (RCTs) and controlled clinical trials (CCTs) investigating stretching as an injury prevention measure were selected. In this study, relevant articles were searched using computer. Among the reviews, one RCT (25%) and 3 CCT (100%)

concluded that stretching exercises could reduce the incidence of exercise related injury.

Bressan LR (2008) conducted a study on the effects of muscle stretching and physical conditioning as physical therapy treatment for patients with fibromyalgia. Based on American college of Rheumatology, about 15 women with a diagnosis of fibromyalgia were selected and divided into two groups, namely muscle stretching and physical conditioning program. They were evaluated for sleep quality, pain modulating factors, associated symptoms and medications used. The result revealed that the muscle stretching had a positive impact on fibromyalgia.

Literature related to effectiveness of stretching exercise on muscle cramps:

Catherine Sullivan (2013) conducted a study on effectiveness of intradialytic massage on leg cramping among hemodialysis patients. A total number of 32 hemodialysis patients with frequent lower extremity cramps during treatment were included in this study and were equally divided into interventional and control group. A 20 minutes massage to the lower extremity was given to the interventional group and the control group received usual care by dialysis center staff. The results showed that the patients in the interventional group reported decreased incidents of cramping at dialysis than the control group. This study revealed that the effectiveness of intradialytic massaging on cramping during dialysis.

Magda Muhammadu (2007) conducted a study at Assuit University, Egypt on impact of stretching exercise protocol on reduction of muscle cramping during

hemodialysis among CRF patients. Quasi Experimental research design was used in this study. The sample size was 60. Purposive sampling technique used. Three tools were included in this study, tools of socio economic demographic data, tools of patient information about muscle cramps and tool of evaluated patient's knowledge & skills after performance exercise. The result revealed that there was a significant improvement in patients knowledge and skills with regard to stretching exercise which further reduced their muscle cramps. Finally the study recommended that, dialysis patient need appropriate intervention to relieve muscle cramps.

Tae-du Jung and Sun- Hee Park (2011) conducted a study on intradialytic stretching exercise programs for hemodialysis patients at Korea. The exercise programme consisted of aerobic, resistance exercise performed two or three times a week during hemodialysis with moderate intensity for 30 minutes. Pre test was given for eight weeks and Post test was assessed at the end of 8^{th} week of procedure. Borg's 15 point scale was used for rating of perceive exertion. The study reveals that intradialytic exercise programme in hemodialysis patients has been found to be beneficial.

Gowthami (2014) conducted study on the effectiveness of intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis in a selected hospital at Mangalore". A quasi experimental design was used in this study and purposive sampling technique was adopted. Sample size was 30 CRF patients were selected. Modified Numerical Intensity Scale was used. The result revealed that there was a significant difference between the pre and post test muscle cramps score in the interventional group (50.297, $p<0.05\%$). This study

concluded that intradialytic stretching exercise was effective in reducing muscle cramps among CRF patients undergoing hemodialysis.

McMurray A (2008) conducted a study to assess the effect of intradialytic foot pedal exercise on blood pressure and muscle cramps in hemodialysis patients at Western Australia. A total number of 17 patients were selected by using convenient sampling technique. The effects of a programe of intradialytic foot pedal exercise on patients blood pressure and level of muscle cramps was recorded and categorized according to the duration and consistence of pedaling. Blood pressure and muscle cramps were measured prior to hemodialysis and then at 4 weeks intervals. This concluded that the effect of intradialytic foot pedal exercise on blood pressure and muscle cramps in hemodialysis patients.

Abbazi Z (2013) conducted a study to assess the effect of intradialytic stretching exercise on severity of symptoms of muscle cramps and quality of sleep in hemodialysis patients at Tehran. Random sampling method was used in this study. A total number of 37 hemodialysis patients were chosen by randomized sampling methods. Patients performed a 30 minutes stretching exercise on legs, three times a week, during the last two hours of every hemodialysis session for 8 weeks. Severity of muscle cramps and quality of sleep were assessed by the Numerical intensity scale and Pittsburgh Sleep Quality Index (PSIQ). The result revealed that at the end of 8weeks, the exercise group (n= 17) had a significant improvement in symptoms of muscle cramps and quality of sleep compared with the control group (n= 16). ($p<0/001$),($p=0/003$).The conclusion of this study showed stretching exercises are effective in reducing muscle cramps symptoms and improving quality of sleep in hemodialysis patients.

CONCEPTUAL FRAMEWORK

Modified Katherine Kolcaba Theory (2007),

According to Nancy burns, (2001) conceptual frame work is a set of interrelated concepts that symbolically represent and convey a mental image of a phenomenon.

Tabot, (1995) stated that a conceptual frame work is a network of interrelated concepts for organizing and describing the phenomenon of interest. Research studies are based on theoretical or conceptual framework that facilitates visualizing the problem and place the variable in a logical context.

Ram sharan**,** stated that a conceptual framework is used in research to outline possible courses of action or to present a preferred approach to an idea or thought.

The present study was based on Modified Katherine Kolcaba comfort theory (2007). In Kolcaba theory of comfort measures are known in variety of ways. The interrelation of health care needs, intervening variables, comfort, health seeking behaviour and institutional integrity provides basis for her theory. Her goal was to help the patient retain his own vitality by meeting the health needs through comfort measures.

Health Care Needs

Katherine Kolcaba defines that health care needs are to those needs identified by the patient or family in a particular nursing practice setting.

In this present study, patients needs are to reduce muscle cramps. Family Needs are lack of knowledge about muscle cramps. Nursing Practice Setting is Dialysis Unit in Sree Abirami Hospital, Sundarapuram.

Comfort Measures

According to Katherine, comfort is an immediate desirable outcome of nursing care. When comfort measures are delivered over time, the comfort level are increased over time with desired health seeking behaviours and improved institutional outcomes.

In this present study, the intervention of intradialytic stretching exercise was administrated 60 times in 10 minutes for 5 consecutive days reduced muscle cramps and promoted their comfort levels with regarding effect of intradialytic stretching exercise on muscle cramps.

Intervening Variables

Katherine Kolcaba defines intervening variables are the factors that are not likely to change and over which health care providers have little control. These variables include financial situation and others.

In this present study, intervening variables are age, sex, occupation, duration of dialysis, etc.... that may influence the muscle cramps among hemodialysis patients.

Comfort

Comfort is a concept that has a strong association with nursing.

Three types of comfort are:

Relief: States specific comfort need for a patient.

Ease: It is a comfortable state of contentment, in which the person experience comfort.

Transcendence: State of comfort in which patients are able to rise above their challenges.

In this present study the hemodialysis patients experienced as specific comfort on relief in muscle cramps when reduced. It was assessed by Modified Brief Pain inventory scale.

Health Seeking Behaviour

Katherine Kolcaba defines that health seeking behaviour and comfort of a patient of behaviours entailed to health.

In this present study the researcher instructed the care giver regarding the effects of intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis.

Institutional Integrity

Institutional integrity is the value, financial stability and wholeness of health care organizational at the local, regional, state and national levels. The best policies are protocols,procedures, developed within an institution for overall use after the collection of evidences.

In this present study the institutional integrity is the Sree Abirami Hospital that posses all qualities that includes patients comfort and postive cost benefits.

CHAPTER-III

RESEARCH METHODOLOGY

Methodology of research organizes all the components of study in a way that is most likely to lead to valid answers to the problem that have been posed. (Burns and Groove, 2002).

Research methodology is a systematic way to solve the research problem and also to carry out the academic study and research in a correct manner**,** (Polit and Beck, 2004)

This chapter includes the description of research approach, research design, setting of the study, variables, population, sample, sample size, sampling technique, criteria for sample selection, developing and description of tool, validity and reliability of the tool, method of data collection procedure, plan for data analysis and interpretation of data.

Research Approach

The research approach is defined as systematic investigation to establish facts or principles or to collect information on a subject.

Polit and Hungler (2011) defined the research approach as a general set of orderly, disciplined procedures used to acquire information.

The research approach is the most essential part of any research. The research approach used in the study was Quantitative approach to find out how well the intervention is effective.

Research Design

Suresh k Sharma stated that the research design is the master plan specifying the methods and procedures for collecting and analyzing the needed information in a research study.

Polit and Hungler (2004) defined research design as an overall plan for addressing a research question including specification for enhancing the study integrity.

A quasi experimental pre-test and post-test design with control group was chosen for analyzing the effectiveness of intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis.

Purposively selected hemodialysis patients	Muscle cramps										
	Pre-Test					Intervention	Post- Test				
	D1	D2	D3	D4	D5		D1	D2	D3	D4	D5
Intervention Group	O1	O1	O1	O1	O1	X	O2	O2	O2	O2	O2
Control Group	O3	O3	O3	O3	O3	_	O4	O4	O4	O4	O4

Key

O_1 : pre –test level of muscle cramps in interventional group.

O_2 : post – test level of muscle cramps in interventional group

X : intradialytic stretching exercise intervention

O_3 : pre-test level of muscle cramps in control group

O_4 : post-test level of muscle cramps in control group

Variables

Variables can be defined as any aspect of a theory that can vary or change as part of the interaction within the theory. In other words, variables are anything that can effect or change the results of a study. Every study has variables as these are needed in order to understand differences (Christopher L. Heffner).

1) Independent variable

Independent variable is the variable which has the presumed effect on the dependent variable (Basavanthappa BT, 2007)

In this present study the independent variable was intradialytic stretching exercise.

2) Dependent variable

Dependent variable is often referred to as the consequence or the presumed effect that varies with a change in the independent variable (Basavanthappa BT, 2007)

In this present study the dependent variable was Muscle Cramps.

Setting of the Study

Research settings are specific places in a research where data collection is to be made. The selection of setting was done on the basis of feasibility of conducting the study, availability of subjects and permission of authorities. (Polit and Hungler, 2004).

The present study was conducted at Sree Abirami Hospital, Sundarapuram, Coimbatore.

Sree Abirami hospital is one of the best Nephro Urology hospitals in Coimbatore. It is a 300 bedded multispecialty hospital having dialysis unit with hi-tech facilities. This has been awarded as "Wellness in kidney care" and an ISO Certified (1901-2008) tertiary hospital. About 30 to 40 kidney transplantations are done every year. SAH does nearly 1000 dialysis per month and 20-25 patients are dialyzed in a day, out of which 90% are Chronic Renal Failure patients.

Population

Population refers to the aggregate (or) totality of all the objects, subject (or) numbers that conform to a set of specifications (Polit & Hungler, 1999).

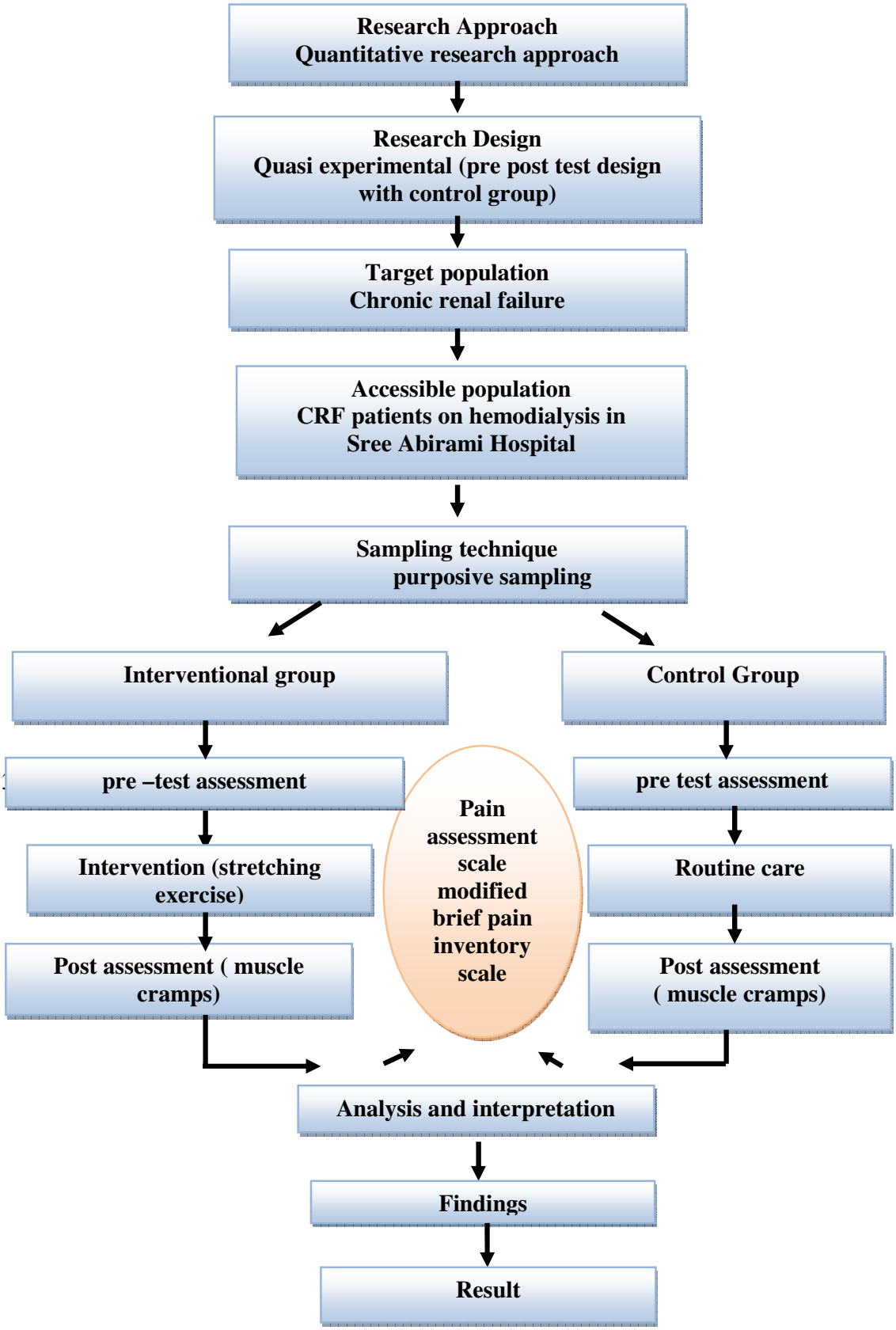
Target population

Renal failure patients undergoing hemodialysis.

Accessible population

CRF patients undergoing hemodialysis at Sree Abirami hospital, Coimbatore.

SCHEMATIC METHODOLOGY:



Sample

According to Polit and Beck (2004), a sample is a subset of population selected to participate in a research study, it is a portion of the population which represents the entire population.

The samples selected for the present study were patients with muscle cramps undergoing hemodialysis in Sree Abirami Hospital, Coimbatore**.**

Sample Size

Sample size was normally decided by nature of the study, nature of population, type of sampling technique, tool variables, statistical test adopted for data analysis sensitivity of the measures. (Polit and Beck 2002)

The total sample size was 60 patients, out of which 30 patients were in control group and 30 in interventional group.

Sampling Technique

Polit and Hungler (2005) stated that the process of selecting a portion of the population is to represent the entire population.

The sample was selected for this study by adopting **purposive sampling technique** which means selection of the most readily available clients. In this study, patients with muscle cramps undergoing hemodialysis were selected based on inclusion and exclusion criteria.

Criteria for sample selection

Inclusion criteria

Hemodialysis patients who were

- within the age group 20 to 60 years.

- understand either Tamil or English .
- willing to participate.
- both the genders..
- available during the period of data collection
- more than two cycle of hemodialysis.
- with muscle cramps assessed by modified brief pain inventory scale.

Exclusion criteria

Hemodialysis patients with

- femoral catheter.
- any lower limb pathology such as amputation, diabetes footulcer, sores or wounds
- pitting edema present in lower limb greater than 2+
- semi consciousness

Tool Description

Treece and Treece emphasized that the instrument selected in research should as for as possible be the vehicle that would best obtained data for drawing conclusion pertinent to the study.

In this study, tool consists of three sections to assess the effectiveness of intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis.

Section A

Demographic variables are age in years, sex, education, occupation,

Section B

Clinical Variables are Urea, Creatinine, Potassium, Duration of dialysis, Frequency of dialysis and types of access.

Section C:

Modified brief pain inventory scale to assess the level of muscle cramps. The questionnaire consists of 9 statements.

Scoring Procedure:

Modified Brief Pain Inventory Scale consists of 9 statements assessing subjective experiences of muscle cramps and each item has been graded on an 0-10 numerical scale.

Pain Severity Scale:

S.No	Score	Description
1	0	No Pain
2	1-3	Mild Pain
3	4-6	Moderate Pain
4	7-9	Severe Pain
5	10	Pain as bad as you can image.

Pain interference score:

This is calculated by adding the obtained scores and then divided by 9. This gives an average score.

Reliability:

Polit and Hungler (1999) stated that reliability refers to the degree of consistency or dependability with which an instrument measures the attribute it design to measure.

The reliability of Modified brief pain inventory scale was tested by implementing the tool on level of muscle cramps among hemodialysis patients, which was administered for 5 sample in Sree Abirami Hospital at Coimbatore . Test retest method (pearson's correlation coefficient Formula) was used to test the reliability of the tool. The tool was found to be reliable, ($r^1 = 0.71$).

Validity

Hosting – Tolsama (1989) stated that content validity is a judgement regarding how well the instrument represents the characteristics to be assessed judgement are based on prior research in the field and the opinions of experts

According to Burns and Groove (2005), "The validity of an instrument is the determination of the extent to which the instrument actually reflect the abstract construct that is being examined.'' Validity addresses the appropriateness, meaningfulness and usefulness of the specific inferences made from instrument scores.

The content validity of the instrument was evaluated by five nursing experts and two medical experts in the field of nephro-urology.

Pilot study:

Polit and Hungler (1999) a small scale version or trail done in preparation for the major study.

The pilot study was conducted in Sree Abirami Hospital at Coimbatore. 10 samples were selected, 5 samples in control and 5 in interventional group after having obtained written permission. The purpose was to find out the feasibility of the study and the study was found to be feasible.

Data Collection Procedure

Data collection is the gathering of information needed to address the research problem. The word "data" means information that is systematically collected in the course of a study.

According to Polit and Hungler (2005) "data collection is the gathering of information needed to address a research population."

Prior to the data collection permission was obtained from the authorities of Sree Abirami Hospital to conduct the study. Data was collected during the month of August.

The purpose of the study was explained to the samples in the inductory session. The data was collected through Modify Brief Pain Inventory Scale with structured questionnaire method. Totally 60 samples were selected for the study 30 were in allotted in interventional group and 30 were in control group. The pre test was conducted for the interventional patients with muscle cramps undergoing hemodialysis. The investigator, performed stretching exercise to increase dorsiflexion

of the ankle with knee slightly flexion and ankle was extended and flexed for 60 times to contract and relax the gasstrocnemius and soleus muscle. This procedure was done in the alternative days such as Monday, Wednesday and Thursday in the selective days for five days.

Sample were in the control group were allotted in the consecutive days such as Tuesday, Friday and Saturday. As a pre and post test was administered for two minutes per samples with structured questionnaire method and routine nursing care was administered by giving normal saline through intravenously. Post level of muscle cramps was assessed after the pre test with no intervention.

Method of Data Analysis and Presentation

Demographic variables were analyzed by using descriptive statistics (frequency, percentage)

The effectiveness of intradialytic stretching exercise were analyzed by using inferential statistics (paired, unpaired 't'test , Mean, Standard deviation, Mean differences).

Association between level of muscle cramps among CRF patients undergoing hemodialysis with selected demographic and clinical variables were analyzed by chi-square.

Protection on Human Rights

The study was conducted after the approval of ethical committee in hospital and research committee of the college of nursing. The nature and purpose of the study was explained to the care personnel involved. The informed written consent was obtained from the study participant. The anonymity of the sample was maintained throughout the study

CHAPTER IV

DATA ANALYSIS AND INTERPREATTION

Polit and Beck, (2003) has defined that the data analysis as "The systematic organization, synthesis of research data and testing of research hypothesis using those data."

The chapter deals with the analysis and interpretation of data collected from 60 (30 control and 30 interventional group) hemodialysis patients, sree abirami hospital, Coimbatore, to assess the effectiveness of intradialytic stretching exercise on muscle cramps among hemodialysis patients.

The analysis and interpretation of this study was based on the data collected through structured interview method from the patient's with schizophrenia. The results were computed using descriptive and inferential statistics.

The study findings are presented in sections as follows:

Section - I : Data on demographic variables of patients with muscle cramps among hemodialysis interventional and control group.

Section – II : Data on assessment level of muscle cramps among patients with hemodialysis.

Section –III :Data on effectiveness of intradialytic stretching exercise in reducing the level of muscle cramps among patients with hemodialysis.

Section – IV : Data on association between level of muscle cramps among patients with hemodialysis with their selected demographic variables and clinical variables.

SECTION I

DATA ON DEMOGRAPHIC VARIABLES OF CLIENTS WITH MUSCLE CRAMPS

Table: 1

Frequency and Percentage Distribution of Clients with muscle cramps in relation to their Selected Demographic Variables in Interventional and Control group.

S.No.	Demographic Variables	Interventional		Control		Total	
1.	Age In Years						
	a. 20-30 years	0	0	5	16.6	5	8.3
	b. 31-40 years	6	20	4	13.3	10	16.6
	c. 41-50 years	10	33.3	9	30	19	31.6
	d. 51-61 years	8	26.6	8	26.6	16	26.6
	e. Above 60	6	20	4	13.3	10	16.6
2.	Gender						
	a. Male	22	73.3	21	70	43	71.6
	b. Female	8	26.6	9	30	17	28.3
3.	Education						
	a. No formal	13	43.3	18	60	31	51.6
	b. Primary education	10	33.3	10	33.3	20	33.3
	c. Secondary education	6	20	2	6.6	8	13.3
	d. Graduates	1	3.3	0	0	1	1.66
4.	Occupation						
	a. govt. employee	1	3.33	0	0	1	1.66
	b. Self employee	10	33.3	10	33.3	20	33.3
	c. Unemployee	19	63.3	20	66.6	39	65
5.	Monthly income						
	a. Rs. 5000-10000	17	56.6	20	66.6	37	61.6
	b. Rs.10001-15000	10	33.3	10	33.3	20	33.3
	c. Rs.15001-20000	2	6.66	0	0	2	3.33
	d. Rs.>20000	1	3.33	0	0	1	1.66
6.	Duration of dialysis						
	a. 1 yr-3 yrs	12	40	14	46.6	26	51
	b. 4 yrs-6 yrs	18	60	16	53.3	34	49
	c. above 7 yrs	0	0	0	0	0	0

(Contd.,)

S.No.	Demographic Variables	Interventional		Control		Total	
8.	Frequency of dialysis						
	a. Once a week	0	0	0	0	0	0
	b. Twice a week	24	80	22	73.3	46	76.6
	c. Thrice a week	6	20	8	26.6	14	23.3
9.	Types of access						
	a. Jugular fistula	7	23.3	8	26.6	15	25
	b. A.V fistula	23	76.6	22	73.3	45	75
10.	Potassium						
	a. Below 3.5 mEq/l	10	33.3	6	20	16	26.6
	b. Normal	0	0	0	0	0	0
	c. Above 3.5 mEq/l	20	66.6	24	80	44	73.3
11.	Serum urea						
	a. Below 10 mEq/l	0	0	0	0	0	0
	b. Normal	0	0	0	0	0	0
	c. Above 50 mEq/l	30	100	30	100	60	100
12.	Serum creatinine						
	a. Below 0.5 mEq/l	0	0	0	0	0	0
	b. Normal	0	0	0	0	0	0
	c. Above 1.5 mEq/l	30	100	30	100	60	100

Table 1 reveals regards to age, the majority of the patients 10(33.3%) belonged to 41-50 years and 6(20%) each were in the age of 31-40 years and above 60 years in interventional group and in control group majority of the patients 9(30%) belonged to 41-50 years and 4(13.3%) each were in the age of 31-40 years and above 60 years.

With regards to gender, the majority of the patients 22(73.3%) belonged to male and 8(26.6%) were females in interventional group and in control group majority of the patients 21(70%) belonged to male and 9(30%) were females.

With regards to education, the majority of the patients 13(43.3%) had not undergone any formal education and only 1(3.3%) was a graduate in the interventional group and in control group majority of the patients 18(60%) had undergone no formal education and only 2(6.6%) were graduates.

With regards to occupation the majority of the patients 19(63.3%) were unemployed and 1(3.33%) was a govt. employee in interventional group and in control group majority of the patients 20(66.6%) were unemployed and 10(33.3%) were self employed.

With regards to monthly income the majority of the patients 17(56.6%) were earning between Rs. 5000-10000/- and 1(3.33%) was earning above Rs.20000 in interventional group and the monthly income in control group, the majority of the patients 20(66.6%) were earning between Rs. 5000-10000/- and 10(33.3%) were earning between Rs.10001-15000/-.

Regarding duration of dialysis the maximum 18(60%) in interventional group and 16(53.3%) in control group were undergoing hemodialysis for 4-6 years.

As to frequency of dialysis, majority 24(80%) and 22(73.3%) respectively in interventional and control group were undergoing dialysis twice a week.

Regarding types of access, majority had AV fistula were 23(73.3%) and 22(73.3%) in interventional and control group respectively.

With regards to potassium the majority of the patients 20(66.6%) in interventional group and 24(80%) in control group had above 4.5 mEq/l and none of them had normal level in both the groups.

With regards to level of serum urea, all the patients 60(100%) in interventional group and control group had above 50 mEq/l and none of them had normal level in both the groups.

Regarding creatinine level, all the subjects in both the groups had above 1.5 mg/l.

SECTION II

DATA ON LEVEL OF MUSCLE CRAMPS AMONG PATIENTS

UNDERGOING HEMODIALYSIS

TABLE 2.1

Frequency and percentage distribution of pre-test level of muscle cramps among patients undergoing hemodialysis in control group

N = 30

S. No.	Level of Muscle Cramps	Pre Test Value									
		DAY1		DAY2		DAY3		DAY4		DAY5	
		n	%	n	%	n	%	n	%	n	%
1	No pain	-	-	-	-	-	-	-	-	-	-
2	Mild	-	-	-	-	-	-	-	-	-	-
3	Moderate	8	26.6	15	50	8	26.6	10	33.3	8	26.6
4	Severe	22	73.3	15	50	22	73.3	20	66.6	22	73.3

The table 2.1 shows that the majority of 22(73.3%), 15(50%), 22(73.3%), 20(66.6%) and 22(73.3%) respectively had severe muscle cramps in day 1,2,3,4 and 5 in the control group.

TABLE 2.2

Frequency and percentage distribution of post-test level of muscle cramps among patients undergoing hemodialysis in control group

N = 30

S. No.	Level Of Muscle cramps	Post Test Value									
		DAY1		DAY2		DAY3		DAY4		DAY5	
		n	%	n	%	n	%	n	%	N	%
1.	No pain	-	-	-	-	-	-	-	-	-	-
2.	Mild	-	-	-	-	-	-	-	-	-	-
3.	Moderate	13	43.3	19	63.3	8	26.6	21	70	13	43.3
4.	Severe	17	56.6	11	36.6	22	73.3	9	30	17	56.6

The table 2.2 shows that, the post test level of muscle cramps was severe among 17(56.6%), 11(36.6%), 22(73.3%), 9(30%) and 17(56.6%) respectively during day 1, 2, 3, 4 and 5 and none of them had mild pain and no pain in control group.

TABLE 2.3

Frequency and percentage distribution of pretest level of muscle cramps among patients undergoing hemodialysis in interventional group

N=30

S. No.	Level Of muscle cramps	Pre Test Value									
		DAY1		DAY2		DAY3		DAY4		DAY5	
		n	%	n	%	n	%	n	%	n	%
1.	No pain	-	-	-	-	-	-	1	3.33 %	2	6.66 %
2.	Mild	-	-	-	-	-	-	2	6.66 %	-	-
3.	Moderate	7	23%	13	43.3 %	17	56.6 %	20	66.6 %	9	30%
4.	Severe	23	77%	17	56.6%	13	43.3%	7	23.3%	19	63.3%

The table 2.3 shows that, the pre test level of muscle cramps among 7(23%), 13(43.3%) and 17(56.6%) respectively were moderate and 23(77%), 17(56.6%) and 13(43.3%) respectively were severe in day 1,2and 3 whereas majority of 20(66.6%) had moderate level of muscle cramps and minority of 1(3.33%) had no pain during 4th day. In day 5, maximum 19(63.3%) had severe muscle cramps and 2(6.66%) had no pain and none of them had mild pain.

TABLE 2.4

Frequency and percentage distribution of post-test level of muscle cramps among patients undergoing hemodialysis in interventional group

N= 30

S. No.	Level of Muscle Cramps	Post Test Value									
		DAY1		DAY2		DAY3		DAY4		DAY5	
		n	%	n	%	n	%	n	%	n	%
1.	No pain	-	-	-	-	4	13.3 %	3	10%	2	6.66 %
2.	Mild	24	80%	20	66.6 %	16	53.3 %	20	66.6%	17	56.6 %
3.	Moderate	6	20%	10	33.3 %	10	33.3 %	7	23.3%	11	3.3%
4.	Severe	-	-	-	-	-	-	-	-	-	-

The table shows that, in the interventional group 6(20%), 10(33.3%), 10(33.3%), 7(23.3%), 11(3.3%) respectively during day 1, 2, 3, 4, and 5 had moderate muscle cramps and 24(80%), 20(66.6%), 16(53.3%), 20(66.6%), 17(56.6%) respectively had mild muscle cramps during 1st to 5th days of hemodialysis. During days 3, 4 and 5 about 4(13.3%), 3(10%) and 2(6.66%) respectively had no pain and none of them had severe pain during all days.

SECTION III

DATA ON EFFECTIVENESS OF INTRADIALYTIC STRETCHING EXERCISE ON MUSCLE CRAMPS AMONG PATIENTS UNDERGOING HEMODIALYSIS

TABLE 3.1

Mean, Standard Deviation, Mean Difference on pre test and post test level of muscle cramps among patients undergoing hemodialysis in interventional group

S.No.	Descriptive		Day1	Day 2	Day 3	Day 4	Day 5	Average score
1.	Mean	Pre test	7.3	6.7	6.3	5.4	6.6	6.49
		Post test	2.66	3.43	3.46	2.5	3.16	3.04
2.	Standard deviation	Pre test	0.99	0.93	1.06	2.20	1.98	1.43
		Post test	0.88	0.74	1.01	1.31	1.23	1.03
3.	Mean Difference		4.64	3.27	2.84	2.90	3.44	3.41

The above table reveals that the mean average of pre test and post test score was 6.49 and 3.04 respectively, which was evident that the pre test score of 6.49 falls under the category of severe pain and the post test score of 3.04 was mild pain. The average value of the standard deviation in pre test and post test score was 1.43 and 1.03 respectively in the interventional group. It indicates the intradialytic stretching exercise was effective to reduce muscle cramps.

TABLE 3.2

Mean, Standard Deviation, Mean Difference on pre test and post test level of muscle cramps among patients undergoing hemodialysis in control group

S. No.	Descriptive		Day1	Day 2	Day 3	Day 4	Day 5	Average score
1.	Mean	Pre test	7.16	6.63	7.06	6.7	7.16	6.94
		Post test	6.76	6.23	6.7	6.2	6.73	6.4
2.	Standard deviation	Pre test	1.11	0.88	1.06	0.9	1.11	1.02
		Post test	1.35	1.00	1.01	0.94	1.3	1.12
‘ 3.	Mean Difference		0.4	0.4	0.36	0.5	0.43	0.41

This table projects that the average mean scores of pre test and post test was 6.94 and 6.52 respectively. Further there was no much variation in the standard deviation scores between pre test and post test. Hence, it can be inferred that there was no much pain reduction in the control group as in interventional group.

TABLE 3.3

Paired t' test score of muscle cramps among patients undergoing hemodialysis in Interventional and control group

N=30

S.No.	Patients undergoing hemodialysis	Paired "t" test					
		Day 1	Day 2	Day 3	Day 4	Day 5	Average score
1.	Interventional groups	12.03 *	15.72 *	16.29 *	18.42 *	23.83 *	17.25
2.	Control groups	3.90	4.0	4.3	4.5	4.8	4.3

*Significant $p<0.05$

The table 3.1 reveals that the average paired t test value of interventional group was 17.25, which was highly significant at $p<0.05$ level during 1st to 5th days of hemodialysis session. It is inferred that the stretching exercise was found to be effective on muscle cramps among patients undergoing hemodialysis.

The average paired t test value of control group was 4.3 which was significant at $p< 0.05$ during 1st to 5th days of hemodialysis session due to usual nursing care provided to the patients in order to relieve muscle cramps. However the scores of interventional group were much higher than that of the control group, which is evident for the effectiveness of intradialytic stretching exercise to relieve muscle cramps.

TABLE 3.4

Unpaired ‘t’ test score of muscle cramps among patients undergoing hemodialysis in Interventional and control group

N=30

S. No	Patients undergoing hemodialysis	Unpaired ‘t’ test					
		Day 1	Day 2	Day 3	Day 4	Day 5	Average score
1.	Interventional and control group	18.6*	18.7 *	19.4 *	21.7 *	24.1 *	20.5

*Significant p<0.05

The above table reveals that in the 5 days an average ‘t’ value of 20.6 was found to be significantly high at p<0.05. Hence it is inferred that the intradialytic stretching exercise was effective among patients undergoing hemodialysis in reducing muscle cramps.

SECTION IV

DATA ON ASSOCIATION BETWEEN MUSCLE CRAMPS AND THEIR DEMOGRAPHIC VARIABLES

TABLE 4.1

$\chi 2$ Distribution post test levels of muscle cramps among patients undergoing hemodialysis with their selected demographic variables in interventional group in Day 1 to 5.

N=30

S. No.	Demographic Variables	Chi Square Value				
		Day 1	Day 2	Day 3	Day 4	Day 5
1.	Age	0.069	1.405	2.70	4.83	9.53*
2.	Gender	0.142	0.77	0.726	0.695	1.085
3.	Education	1.617	0.70	2.125	6.28	3.633
4.	Occupation	0.737	4.62	1.174	3.112	8.46*
5.	Monthly income	3.97	2.76	1.865	5.79	2.37
6.	No. of years of dialysis	0.035	0.624	1.41	0.637	1.085
7.	Frequency of dialysis	0.051	0.099	0.52	1.087	2.736
8.	Types of access	0.184	0.099	1.18	1.776	1.446
9.	Potassium	3.75	3.42	1.10	1.675	3.33
10.	Urea	0	0	0	0	0
11.	Creatinine	0	0	0	0	0

*significant $p<0.05$

Through this table it was inferred that age and occupation had significant association between the levels of muscle cramps among patients undergoing hemodialysis with their demographic variables in interventional group in 5th day. Other demographic variables had significant association between the levels of muscle cramps among patients undergoing hemodialysis.

TABLE 4.2

$\chi 2$ Distribution post test levels of muscle cramps among patients undergoing hemodialysis with their selected demographic variables in control group in Day 1 to 5.

N=30

S.no	Demographic Variables	Chi Square Value				
		Day 1	Day 2	Day 3	Day 4	Day 5
1.	Age	0.675	0.578	3.4	4.441	3.965
2.	Gender	0.004	1.692	0.074	0.522	0.004
3.	Education	1.267	0.248	1.641	1.842	1.132
4.	Occupation	1.119	0.272	2.4	2.49	0.255
5.	Monthly income	1.119	0.272	2.4	3.395	0.624
6.	No. of years of dialysis	0.024	0.013	0.011	3.21	0.400
7.	Frequency of dialysis	1.694	0.003	0.443	0.002	2.770
8.	Types of access	1.637	2.799	0.003	0.45	0.739
9.	Potassium	0.021	0.034	0.538	2.653	0.265
10.	Urea	0	0	0	0	0
11.	Creatinine	0	0	0	0	0

Not significant $p<0.05$

The above table reveals that, there was no significant association found between the levels of muscle cramps among patients undergoing hemodialysis in control group with their demographic variables.

CHAPTER – V

DISCUSSION

This chapter deals with the discussion which was based on the findings obtained from the statistical analysis and its relation to the objectives of the study.

The basic aim of the present study was to assess the effectiveness of intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis. The study was conducted by using a quasi experimental pre-test post-test with control group design. Sree Abirami Hospital was selected for conducting the study. Purposive sampling was used to select the subjects for conducting the study from dialysis unit. The sample size was 60 among which 30 were in interventional group and 30 were in control group.

Modified Brief Pain Inventory Scale was used to assess the level of muscle cramps. The tool was administered through structured interview schedule. The standard scale consists of 9 statements, which details the assessment of Pain. The responses were analyzed by using descriptive statistics (mean, standard deviation, mean percentile, frequency and percentage) and inferential statistics (paired‘t’ test, unpaired‘t’ test and chi square test). Discussions on the findings were arranged based on the objectives of the study.

Objective 1: To assess the level of muscle cramps among patients undergoing hemodialysis in interventional group and control group.

The findings of this study revealed that the CRF patients on hemodialysis in the interventional group during the pre test level of muscle cramps among 7(23%),

13(43.3%) and 17(56.6%) respectively were moderate and 23(77%), 17(56.6%) and 13(43.3%) respectively were severe in day 1,2and 3 whereas majority of 20(66.6%) had moderate level of muscle cramps and minority of 1(3.33%) had no pain during 4th day. In day 5, maximum 19(63.3%) had severe muscle cramps and 2(6.66%) had no pain and none of them had mild pain and the post test level of muscle cramps among 6(20%), 10(33.3%), 10(33.3%), 7(23.3%), 11(3.3%) respectively during day 1, 2, 3, 4, and 5 had moderate muscle cramps and 24(80%), 20(66.6%), 16(53.3%), 20(66.6%), 17(56.6%) respectively had mild muscle cramps during 1st to 5th days of hemodialysis. During days 3, 4 and 5 about 4(13.3%), 3(10%) and 2(6.66%) respectively had no pain and none of them had severe pain during all days.

The study findings are consistent with the results of a study done by Kafkia T 2014 on assessment and management of pain in hemodialysis patients. In this study 70 renal patients on hemodialysis were the subjects. Their pain levels were assessed using Visual Analog Scale and Wong Baker Pain Scale and McGill pain questionnaire. Around 46% of subjects pinpointed internal pain in the legs, which they were managing either with warm towel, massage or painkiller. It was concluded through this study that pain is affecting the everyday life of renal patients.

These findings were supported by Davison NS (2003) conducted a prospective cohort study the prevalence, causes, severity and management of pain. Sample size was 205 Canadian hemodialysis patients. The pain was assessed by Brief Pain Inventory Scale followed by McGill pain questionnaire method. The result showed that, 103 patients reported pain during dialysis and there reported were undergoing hemodialysis therapy longer (52.2 months) than their subjects who reported no pain

(37.7 months). The study concluded that the pain is a significant problem in more than 50% of hemodialysis patients.

Hypothesis 1: There is a significant difference between the interventional group and control group before and after intradialytic stretching exercise.

In this study there was a significant difference in the level of muscle cramps among patients undergoing hemodialysis before and after intradialytic stretching exercise and in between control and interventional group. Hence this hypothesis was accepted.

Objective 2: To determine the effectiveness of intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis in the interventional group.

The results of this study revealed that among interventional group that the average paired t test value of interventional group was 17.25 and the average paired‘t’ test value in control group was 4.3 during 1st to 5th days of hemodialysis session. This shows that the value was higher in Interventional group than in control group. Hence, it can be inferred that the stretching exercise was found to be effective on muscle cramps among patients undergoing hemodialysis.

The average unpaired ‘t’ test value of 20.6 was found to be significantly high at $p<0.05$. Hence it is inferred that the intradialytic stretching exercise was effective among patients undergoing hemodialysis in reducing muscle cramps.

This findings supported by Lynch EK (2008) conducted a systematic and meta analysis on effectiveness of stretching exercise on dialysis related hypotension and muscle cramps. In this study out of 317 potentially relevant articles were searched 7 met the inclusion criteria. Among them, four articles reported results for hypotension

and muscle cramps, 1 had only hypotension and 2 reported only muscle cramps. Stretching exercise had been administered for about 8 weeks. After collecting the data from all 6 articles it was that the pooled odds ratio for cramping after stretching exercise was 0.30 at $p<0.055$ and the remaining 5 articles reported that the pooled odds ratio for hypotension after exercise was 0.28 at $p<0.05$. This study concluded that the stretching exercise was highly beneficial on dialysis related muscle cramps and hypotension.

Hypothesis 2: There is a significant difference in the level of muscle cramps before and after intradialytic stretching exercise in interventional group.

This study finding reveals that there is a significant difference in the level of muscle cramps before and after intradialytic stretching exercise among patients undergoing hemodialysis in interventional groups. Further, the result revealed muscle cramps highly reduced in the interventional group after intradialytic stretching exercise than in the post level in control group. So this hypothesis was accepted.

Objective 3: To find out the association between post test score of muscle cramps among control and interventional group of patients undergoing hemodialysis with their selected demographic variables.

Chi square was calculated to find out the association between the post test scores of control and interventional groups with their selected demographic variables. It was inferred that the age and occupation had significant association with the levels of muscle cramps among patients undergoing hemodialysis. Other demographic variables had no significant association between the level of muscle cramps among patients undergoing hemodialysis.

These findings were supported by Chatrath H, et.al (2012) conducted a study on association of prevalence and morbidity with muscle cramps in patients during hemodialysis session. Sample size was 150 adult patients with muscle cramps who were selected by consecutive sampling technique. Cramps questionnaire and visual analogue scale were used to measure the muscle cramps. The result showed that 67% had muscle cramps during dialysis and this study concluded that the muscle cramps is associated with muscle cramps.

Brass EP (2002) conducted a study to find out the association of peripheral artery disease (PAD) with intradialytic cramps in patients undergoing hemodialysis at USA. Sample size was 122 selected from two separate dialysis centers. Ankle Brachial index (ABI) was used to determine PAD and medical record used to assess intradialytic cramps. The result showed that 52.1% of patients reported cramps during dialysis and had associated with PAD. This study concluded that there is an association between PAD and intradialytic muscle cramps.

Hypothesis 3: There is a significant association in the level of muscle cramps with selected demographic variables.

This study finding reveals that there is no association in the level of muscle cramps in between post test score of muscle cramps among control group of patients undergoing hemodialysis with their selected demographic variables. So this hypothesis was rejected.

CHAPTER – VI

SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter presents a brief account of the present study. Conclusions are drawn from the findings and the implications of the result are stated. It also includes recommendations, implications for the nursing practice, nursing education, nursing administration and nursing research.

Summary

The study was done to assess the effectiveness of intradialytic stretching exercise on muscle cramps among the patients undergoing hemodialysis in Sree Abirami hospital, Coimbatore.

The objectives of the Study were

- to assess the level of muscle cramps among patients undergoing hemodialysis in interventional group and control group.
- to determine the effectiveness of intradialytic stretching exercise on muscle cramp among patients undergoing hemodialysis in the interventional group.
- to find out the association between post level of muscle cramps among patients undergoing hemodialysis with their selected demographic and clinical variables.

A quasi experimental design was used to evaluate the effectiveness of intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis in selected hospital at Coimbatore.

A Non probability purposive sampling technique was adopted to select the subjects.

Tool description:

Investigator had prepared a standardized pain assessment tool- Modified Brief pain inventory scale to assess the effectiveness of intradialytic stretching exercise on muscle cramps during hemodialysis.

Section A

Demographic variables are age in years, sex, education, occupation,

Section B

Clinical Variables are Urea, Creatinine, Potassium, Duration of dialysis, Frequency of dialysis and types of access.

Section C:

Modified brief pain inventory scale to assess the level of muscle cramps. The questionnaire consists of 9 statements.

Scoring Procedure:

Modified Brief Pain Inventory Scale consists of 9 statements assessing subjective experiences of muscle cramps and each item has been graded on a 0-10 numerical scale.

Pain Severity Scale:

S.No	Score	Description
1	0	No Pain
2	1-3	Mild Pain
3	4-6	Moderate Pain
4	7-9	Severe Pain
5	10	Pain as bad as you can imagine

Pain interference score:

This is calculated by adding the obtained scores and then divided by 9. This gives an average score.

The collected data were analyzed by using both descriptive statistics (Mean, Standard deviation, Frequency and Percentage) and inferential statistics (paired and unpaired 't' test and chi-square) and results were calculated.

Major study findings:

The major findings of the study were:

- In the interventional group the post test level of muscle cramps score was moderate for 6(20%), 10(33.3%), 10(33.3%), 7(23.3%), 11(3.3%) respectively during day 1, 2, 3, 4, 5 and 24(80%), 20(66.6%), 16(53.3%), 20(66.6%), 17(56.6%) respectively had mild muscle cramps during 1st to 5th days of hemodialysis. During

days 3, 4 and 5 about 4(13.3%), 3(10%) and 2(6.66%) respectively had no pain and none of them had severe pain during all days.

The results of this study revealed that among interventional group the average paired t test value was 17.25, which was highly significant at $p<0.05\%$ level during 1st to 5th days of hemodialysis session. It is inferred that the stretching exercise was found to be effective on muscle cramps among patients undergoing hemodialysis.

- With regard to effectiveness of intradialytic stretching exercise among interventional group the obtained mean average of pre test and post test score was 6.49 and 3.04 respectively and the average standard deviation in pre test and post test score was 1.43 and 1.03 respectively. It indicates that the intradialytic stretching exercise was effective to reduce muscle cramps.

- With regard to association between the levels of muscle cramps with their demographical variables, the study findings revealed that there was significant association between muscle cramps with age, occupation in the interventional group and no significant association was found in control group.

Conclusion

The main conclusion drawn from this present study was that most of the patients undergoing hemodialysis had significant level of muscle cramps. After stretching exercise session, it was found that there had been a significant level of reduction in muscle cramps. Participants felt comfortable and also expressed high level of satisfaction towards administration of stretching exercise.

It is thus concluded that, intradialytic stretching exercise is an effective and simple strategy to reduce muscle cramps among patients undergoing hemodialysis.

Implication of the study:

Nursing implication usually includes specific suggestions for nursing practice, nursing education, nursing administration and nursing research. Nursing implication for this study is enlisted below.

Nursing Practice:

Clinical nurse can:

- learn accurate assessment of muscle cramps using Modified Brief pain Inventory Scale.
- develop sensitivity to the effect of intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis.
- encourage the importance of stretching exercise as a complementary therapy.
- the findings of the current study can be kept as baseline for providing instruction to reduce muscle cramps among patients undergoing hemodialysis.
- suggest this simple technique for preventing further complication among patients undergoing hemodialysis.

Nursing Education:

Nursing educators can motivate students to:

- learn accurate assessment of muscle cramps using Modified Brief pain Inventory Scale.
- encourage patients to practice of this simple technique.

Nursing Research:

- The study findings can be kept as baseline data and further research can be conducted in same setting.
- Disseminate the finding through the conference, seminars and by publications in professional, national and international journals.

Nursing Administration:

- Organize in-service education programmes for the nurses on this complementary technique

Recommendations:

- The same study can be conducted in different settings such as hospitals, community and rehabilitation centres etc…
- The study can be done in large samples.
- A study can be conducted to assess the effectiveness of intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis.
- This intervention can be taught to all patients undergoing hemodialysis to control muscle cramps.
- Effectiveness of this intradialytic stretching exercise can be compared with other complementary therapies to find its effectiveness.

MODIFIED KATHERINE KOLCOBA THEORY 2007

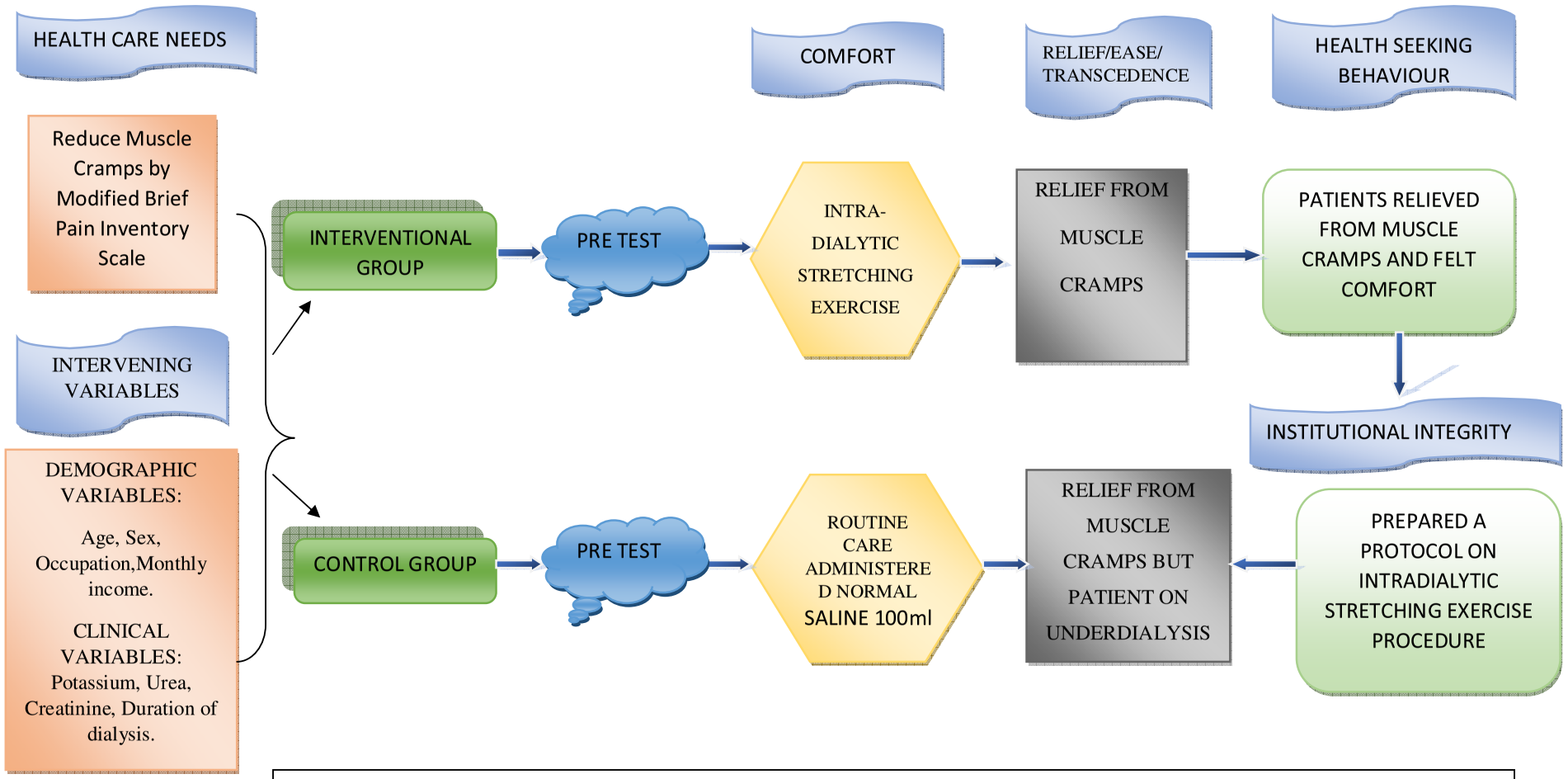


Fig.1 Conceptual Framework Based On Modified Katherine Kolcaba Theory (2007)

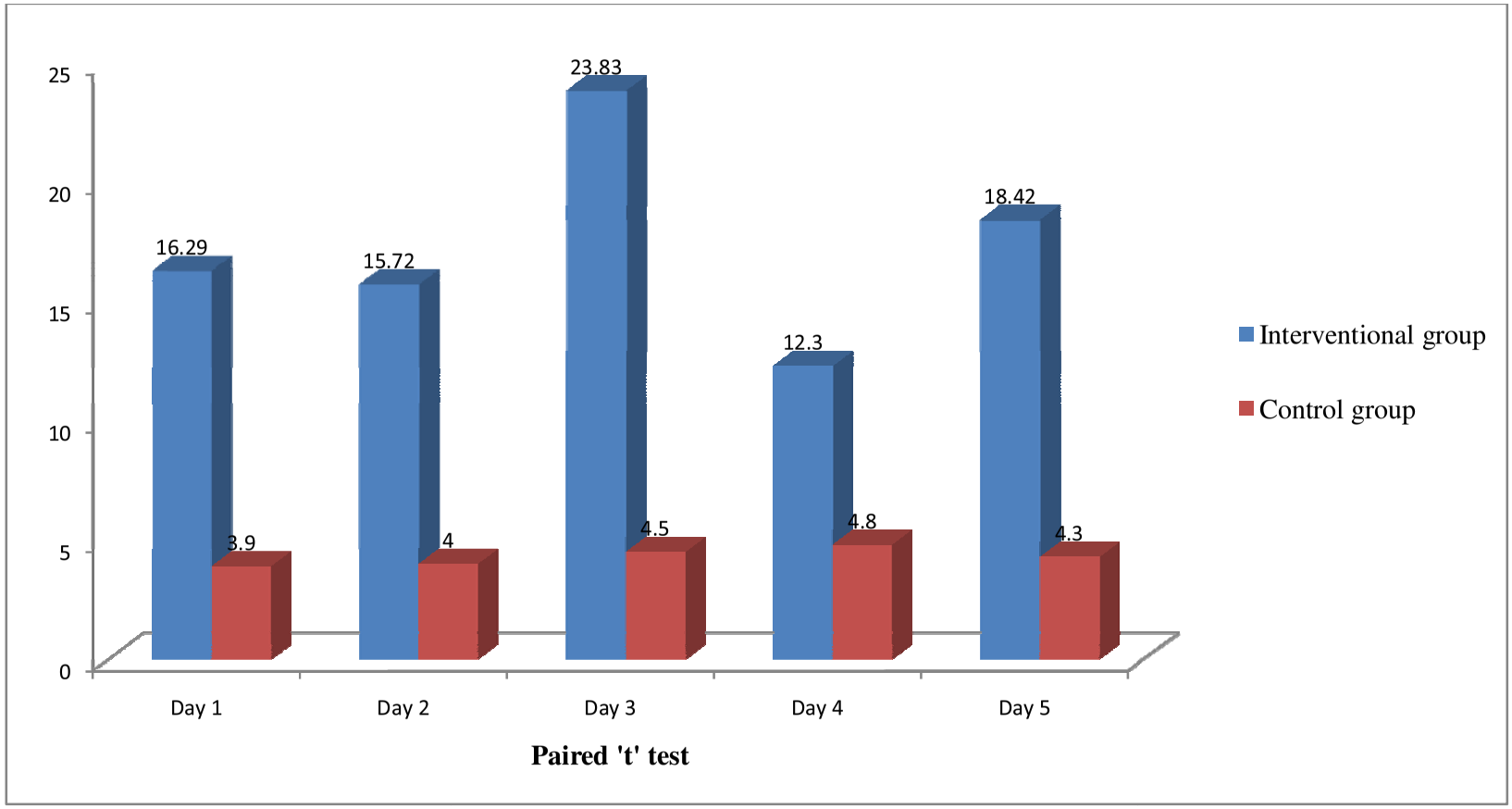


Figure: 7 Paired‘t’ test value level of muscle cramps among patients undergoing hemodialysis in Interventional and Control group.

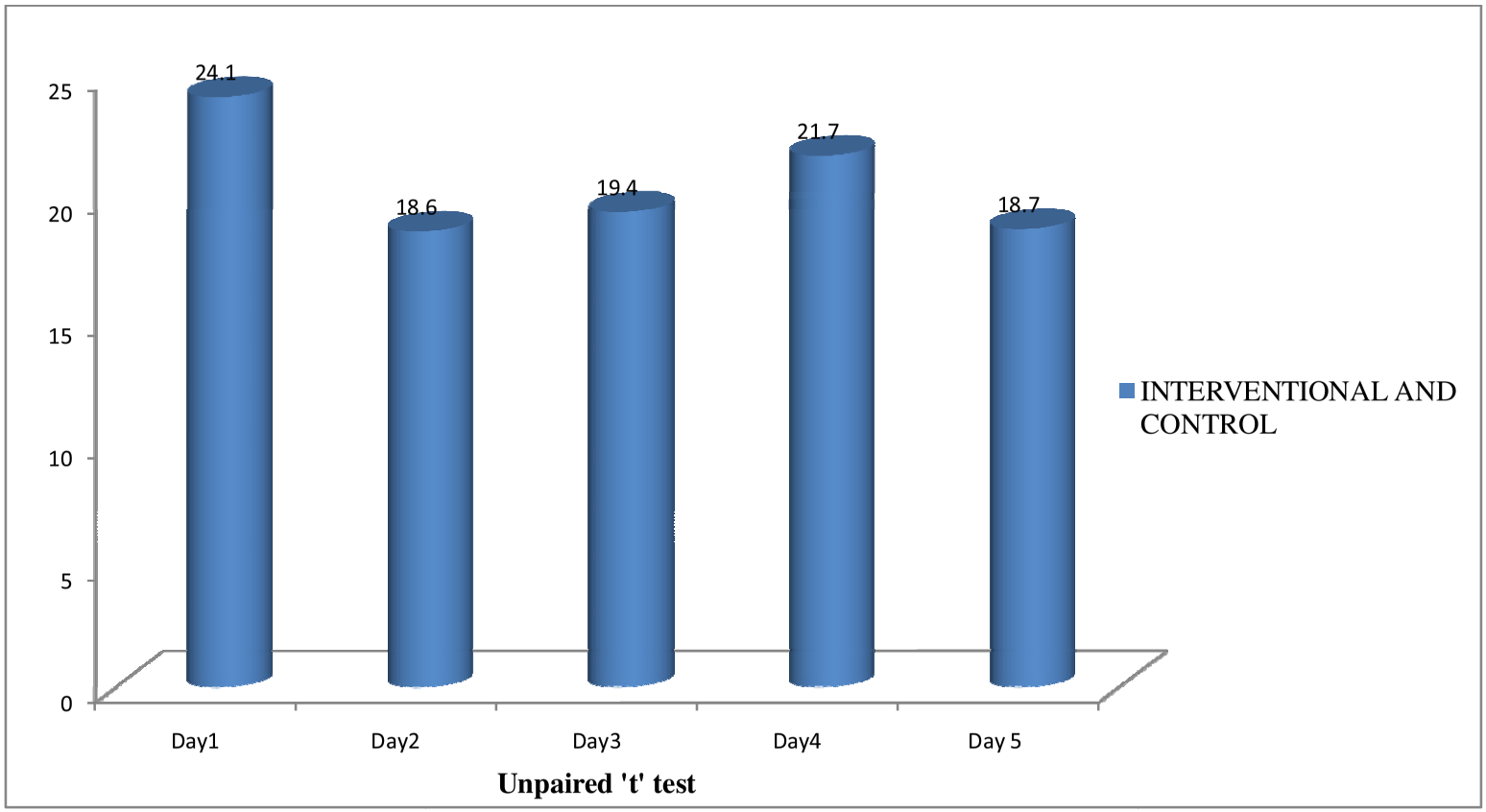


Figure: 8 Unpaired‘t’ test level of muscle cramps among patients undergoing hemodialysis in Interventional and Control group

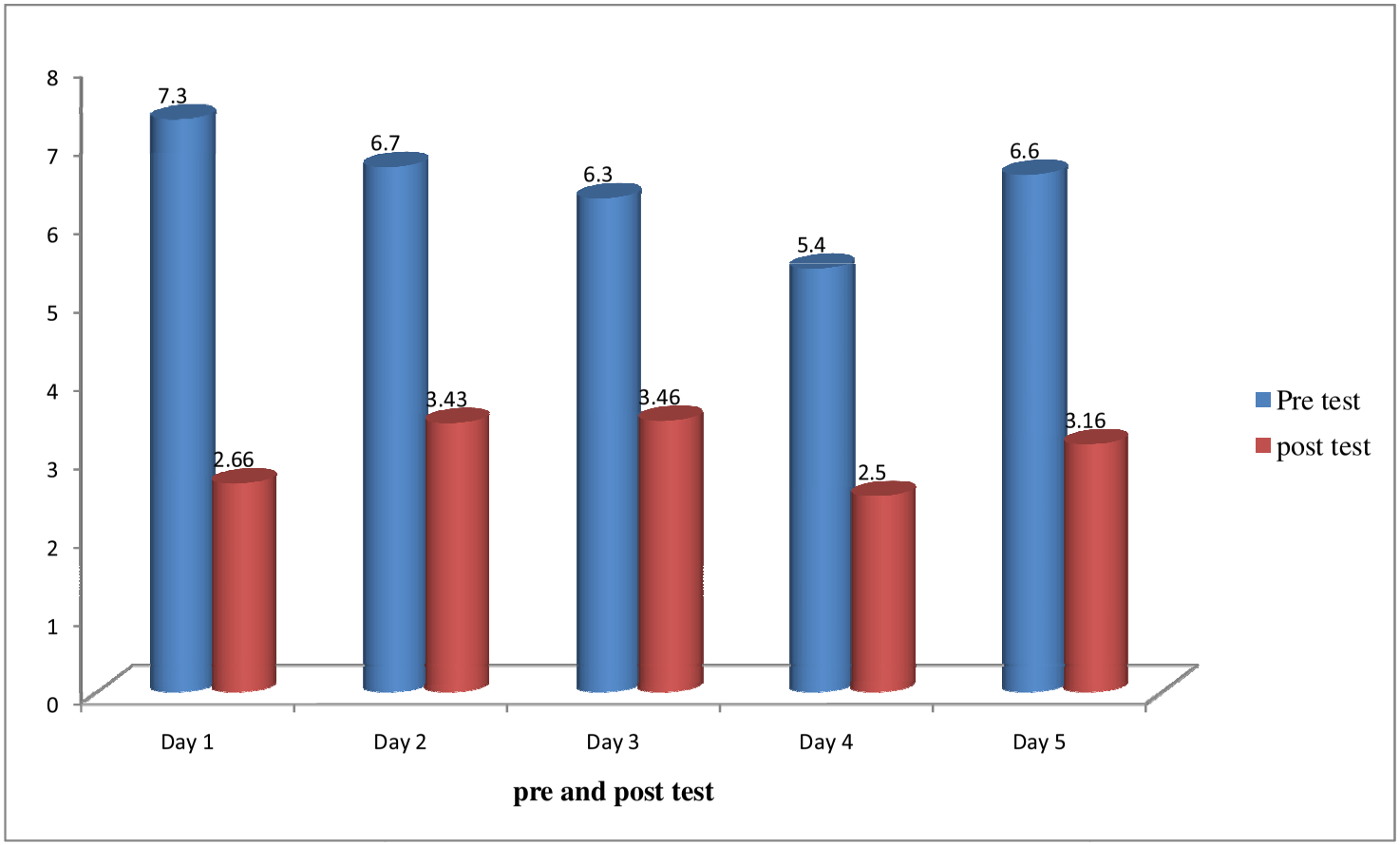


Figure: 3. Mean Value of level of muscle cramps among patients undergoing hemodialysis

Interventional group

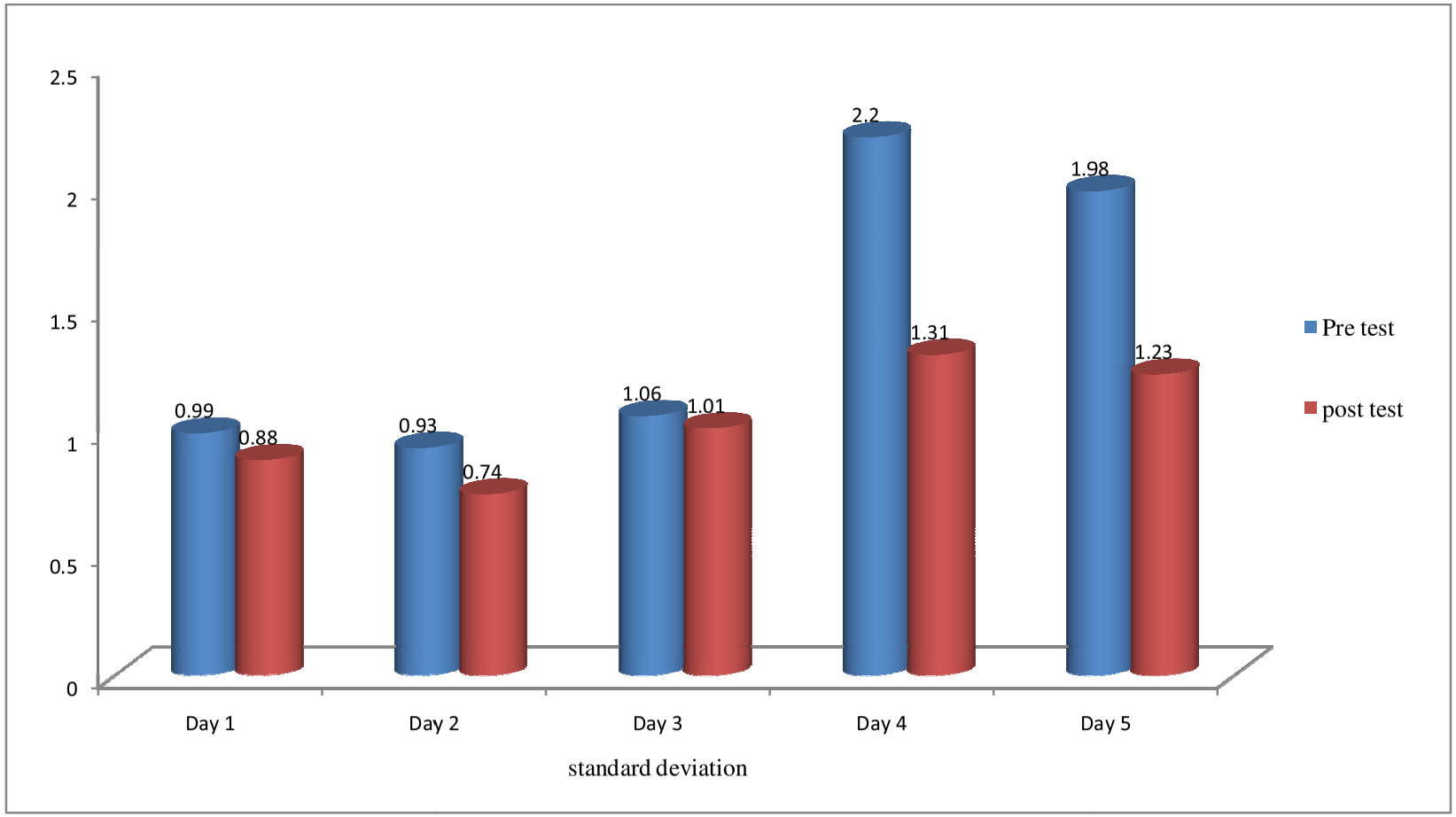


Figure: 4 Standard deviation value level of muscle cramps among patients undergoing hemodialysis Interventional group

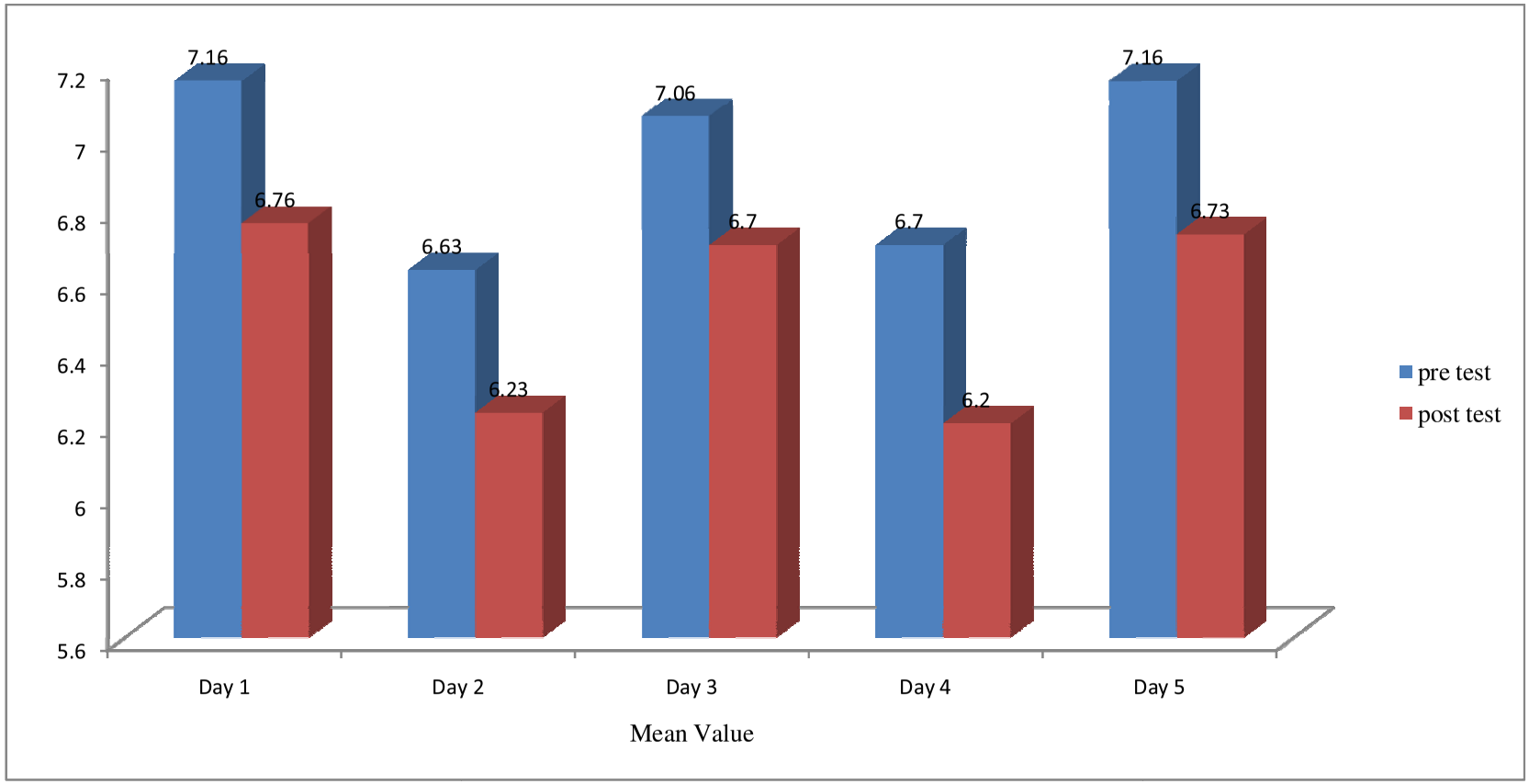


Figure:5. Mean value level of muscle cramps among patients undergoing hemodialysis control group

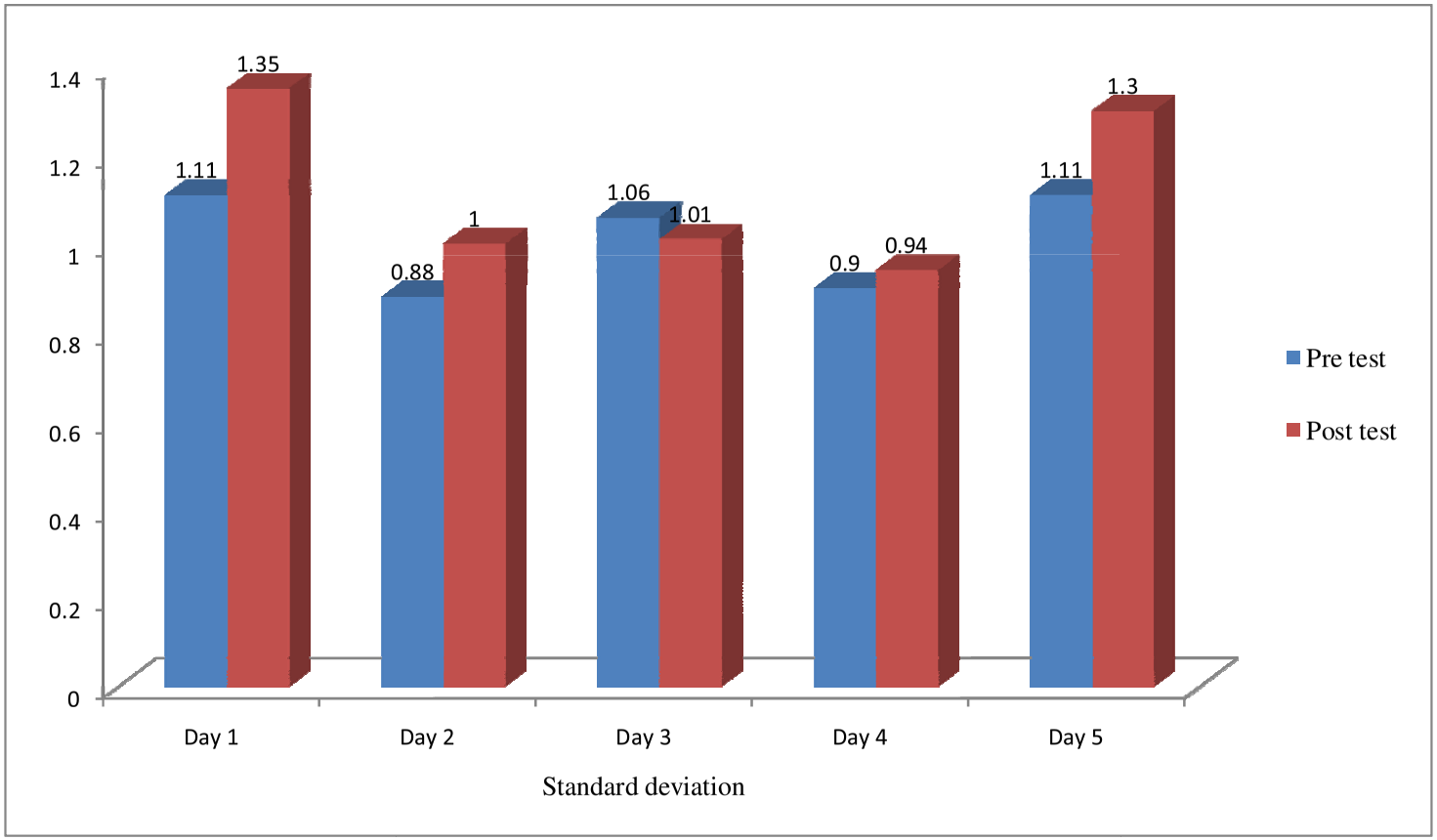


Figure:6 Standard deviation level of muscle cramps among patients undergoing hemodialysis control group

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APPENDIX A

LETTER SEEKING AND GRANDING PERMISSION TO CONDUCT STUDY

Letter seeking permission to conduct study

From

Ms. Divia acha Jacob,

M Sc Nursing II Year,

Sree Abirami College of Nursing,

Coimbatore.

To

Dr. P. Periaswamy, MS., Mch, (Urology),

Honorary Chairman,

Sree Abirami Hospital,

Coimbatore.

Through

The Principal,

Sree Abirami College of Nursing,

Coimbatore.

Sub: Conduction of Research study permission requested reg.

Respected sir,

With due respect, I Ms. Divia Acha Jacob, II Year M. Sc Nursing student studying at Sree Abirami College of Nursing, Coimbatore, require to conduct a research study as a part of the curriculum.

The research topic proposed is "**A study to assess the effectiveness of intradialytic stretching exercise among patients with muscle cramps undergoing hemodialysis in selected hospital at Coimbatore.**"

Therefore I humbly request your good self to grant me permission to conduct the above stated study at your esteemed institution. I assure you Sir, to abide to the rules and regulations of your institution. Further I wish to state that this study will be an useful one for the welfare of the inmates of your institution. Once again I request your kind permission.

Thanking you,

Yours faithfully,

Date : 29/5/15

Place: Coimbatore

Forwarded:

PRINCIPAL
SREE ABIRAMI COLLEGE OF NURSING
COIMBATORE - 641 021.

Permitted to conduct the study for a period of 1 month.

APPENDIX B

LETTER REQUESTING EXPERTS OPINION FOR CONTENT VALIDITY OF THE TOOL AND INTERVENTION

Sree Abirami Charitable Trust
Sree Abirami College of Nursing
Approved by Govt. of Tamilnadu, Recognized by Indian Nursing Council, New Delhi
Tamilnadu Nurses & Midwives Council
Affiliated to the TN Dr.M.G.R Medical University, Chennai.

Machegoundanpalayam Road, Eachanari (po), Coimbatore - 641 021
Tel : 0422- 2466666,2466695,2466696, 2466698, 2466699
E-mail : sreeabiramicollegeofnursing@gmail.com, Web : www.abiraminursingcollege.com

Date :

Requisition for Content validity

From

Ms. Divia Acha Jacob,
M Sc Nursing II Year,
Sree Abirami College of Nursing,
Coimbatore.

To

Through

The Principal,
Sree Abirami College of Nursing,
Coimbatore.

Sub: validation of research tool requested reg.

Respected madam,

With due respect, I Ms. Divia Acha Jacob , II Year M. Sc Nursing student studying at Sree Abirami College of Nursing, Coimbatore, require to conduct a research study as a part of the curriculum. The research topic proposed is "A study to assess the effectiveness of intradialytic stretching exercise on muscle cramps patients undergoing hemodialysis in selected hospital at Coimbatore." I sincerely request to extend your guidance for my content validity.

Thanking you

Date:

yours faithfully,

Place: Coimbatore

Forwarded

PRINCIPAL
SREE ABIRAMI COLLEGE OF NURSING
COIMBATORE - 641 021.

APPENDIX C

NAME LIST OF EXPERTS WHO VALIDATED THE TOOL

Medical Experts:

Dr. P. Periaswamy,

Honorary Chairman,

Sree Abirami Hospital,

Coimbatore.

Dr. Balakrishnan,

Nephrologist,

Sree Abirami Hospital,

Coimbatore.

Nursing Experts:

Prof. Balasubramanian, M.Sc (N)

HOD of Medical Surgical nursing,

KMCH College of Nursing

Coimbatore.

Prof. Kuzhanthaivel, M.Sc (N)

HOD of Medical Surgical nursing,

KMCH College of Nursing

Coimbatore.

Mrs. Soniya dass, M.Sc (N)

Principal,

K.G College of Nursing,

Coimbatore.

Mrs. Kavitha, M.Sc(N),

Vice Principal,

Ganga College of Nursing,

Coimbatore.

Therapist Expert:

Dr. V. Ganesan,

HOD of Physiotherapist,

Ortho One Hospital,

Ramanathapuram,

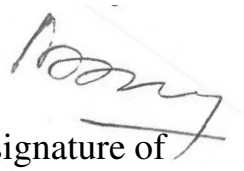
Coimbatore.

CONTENTVALIDITY CERTIFICATE

I hereby certify that I have validated the tool of Ms. Divia Acha Jacob II year MSC nursing of Sree Abirami College of Nursing, Coimbatore, who has proposed to do a study on "**A Study to assess the effectiveness of Intradialytic stretching exercise on muscle cramps among patients undergoing Hemodialysis at selected Hospital Coimbatore.**"

Date: 6.6.15

Place: Coimbatore



signature of expert

Dr. P. Periyasamy,

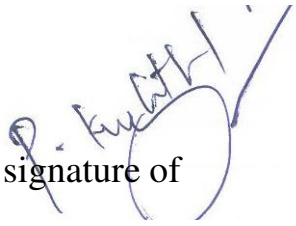
Ms(uro).

CONTENTVALIDITY CERTIFICATE

I hereby certify that I have validated the tool of Ms. Divia Acha Jacob II year MSC nursing of Sree Abirami College of Nursing, Coimbatore, who has proposed to do a study on "**A Study to assess the effectiveness of Intradialytic stretching exercise on muscle cramps among patients undergoing Hemodialysis at selected Hospital Coimbatore.**"

Date: 6.6.15

Place: Coimbatore



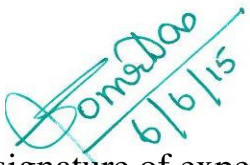
signature of expert

CONTENTVALIDITY CERTIFICATE

I hereby certify that I have validated the tool of Ms. Divia Acha Jacob II year MSC nursing of Sree Abirami College of Nursing, Coimbatore, who has proposed to do a study on "**A Study to assess the effectiveness of Intradialytic stretching exercise on muscle cramps among patients undergoing Hemodialysis at selected Hospital Coimbatore.**"

Date: 6.6.15

Place: Coimbatore



signature of expert

CONTENTVALIDITY CERTIFICATE

I hereby certify that I have validated the tool of Ms. Divia Acha Jacob II year MSC nursing of Sree Abirami College of Nursing, Coimbatore, who has proposed to do a study on "**A Study to assess the effectiveness of Intradialytic stretching exercise on muscle cramps among patients undergoing Hemodialysis at selected Hospital Coimbatore.**"

Date: 6.6.15

Place: Coimbatore

signature of expert

6/6/15

CONTENTVALIDITY CERTIFICATE

I hereby certify that I have validated the tool of Ms.Divia Acha Jacob II year MSC nursing of Sree Abirami College of Nursing ,Coimbatore, who has proposed to do a study on **"A Study to assess the effectiveness of Intradialytic stretching exercise on muscle cramps among patients undergoing Hemodialysis at selected Hospital Coimbatore."**

Date

Place;

K. Ganesan

signature of expert

(K. GANESAN)

CONTENTVALIDITY CERTIFICATE

I hereby certify that I have validated the tool of Ms.Divia Acha Jacob II year MSC nursing of Sree Abirami College of Nursing ,Coimbatore, who has proposed to do a study on "**A Study to assess the effectiveness of Intradialytic stretching exercise on muscle cramps among patients undergoing Hemodialysis at selected Hospital Coimbatore.**"

Date

Place;

Signature of expert

DR. BALAKRISHNAN, MS

APPENDIX E

CERTIFICATE FOR STRETCHING EXERCISE TRAINING

CIN No . U85110TZ1997PTC00822

SPINE ARTHROSCOPIC AND JOINT REPLACEMENT CENTRE PVT. LTD.

DR. DAVID V. RAJAN
M.S. (Orth) M.N.A.M.S. (Orth) F.R.C.S. (G)
(Arthroscopy and Sports injury)
Chairman Cum MD

DR. K. VINODH
M.B., D. Orth., M.Ch., Orth (Liverpool)
(Paediatric Orthopaedics and Joint Replacement)
Director

MRS. SUNEETHA RAJAN
Director

Date: 10.10.2015

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Ms.Divia Acha Jacob doing M.Sc Nursing has undergone her training in the Physiotherapy department from 15.07.2015 to 21.07.2015 as part of her Post grduate project.

For Spine Arthroscopic and Joint Replacement Centre (P) Ltd

K. Ganesan

K. Ganesan. MPT (Sports)
H.O.D Physiotherapy

657, TRICHY ROAD, SINGANALLUR, COIMBATORE - 641 005. TN., INDIA. PH : +91 (0) 422 4055100, 2317118 / 9;
Fax : +91 (0) 422 - 2321288, For Appointments & Surgery Booking No. 4055155, 166 (Direct Line)
e-mail : ortho.one@gmail.com www.ortho-one.in www.jointsindia.org

APPENDIX F

CERTIFICATE FOR EDITING (ENGLISH)

CERTIFICATE FOR EDITING

TO WHOMSOEVER IT MAY CONCERN

Certify that the dissertation paper titled, **"A study to assess the effectiveness intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis selected hospital at Coimbatore"** by Ms.Divia Acha Jacob. has been checked for accuracy and correctness of English Language used in presenting the paper.

P. SURIYA NARAYANAN

23.01.2016.

Dr. P. SURIYA NARAYANAN, PH.D.,
PROFESSOR OF ENGLISH (Rtd).,
G.A.C. COIMBATORE-18.

APPENDIX G

CERTIFICATE FOR EDITING (TAMIL)

CERTIFICATE FOR EDITING

TO WHOMSOEVER IT MAY CONCERN

Certify that the dissertation paper titled, **"A study to assess the effectiveness of intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis at selected hospital, Coimbatore"** by Ms. Divia Acha Jacob. It has been checked for accuracy and correctness of Tamil language used in presenting the paper is lucid, unambiguous , free of grammatical or spelling error and apt for the purpose.

24.12.15

Mrs. Tamilselvi Sivanandham
M.A, B.Ed, MPhil,

APPENDIX H

CONSENT FORM (ENGLISH)

Respected Sir / Madam,

I am Divia Acha Jacob, I am doing my second year M.Sc.,(N) in Sree Abirami College of Nursing. I am conducting a Research on " A study to assess the effectiveness of intradialytic stretching exercise on muscle cramps among patients undergoing hemodialysis at selected hospital at Coimbatore". I am interested to know about your pain level to complete my project. This is only for educational purpose and the confidency of your response will be maintained.

Part: I Questionnaire related to demographic variables

Total number of questions 11.

Part: II Structured interview modified brief pain inventory scale

related to level of pain.

APPENDIX I

CONSENT FORM (TAMIL)

குறிப்பு :

திரு/திருமதி

என் பெயர் ---------- நான் அபிராமி செவிலியர் கல்லூரியில் இறுதியாண்டு முதுநிலை பட்டப்படிப்பு பயில்கிறேன். நான் உங்களிடம் வலியின் தன்மையை அறிந்து கொள்ள வந்துள்ளேன். இது என்னுடைய படிப்பு சம்பந்தமான ஆராய்ச்சி ஆகும். தங்களின் மேலான ஒத்துழைப்பும்,மனம் திறந்த பதிலும் தேவை. உங்களுடைய பதில்கள் ரகசியமாக வைக்கப்படும்.

பகுதி -1 : பன்னணி விவரம் மொத்த வினாக்கள் :18

பகுதி -2 : நோயாளியின் விலியின் தன்மையை நேர்காணலின் மூலம் ஆராய வடிவமைக்கப்பட்ட அளவுகோல்.

நேர்முகத் தேர்வானர் கேள்வி கேட்ட பின் பதிலை ஒன்றன் பின் ஒன்றாக வாசிப்பார். பதிலுரைப்பவர் கூறும் சரியான விடைகளுக்கு அந்த எண்ணிற்கு எதிராக ( ) என்று குறியிடுவார்.

நோயாளி கொடுக்கப்பட்ட வலியின் தன்மையை ஆராய வடிவமைக்கப்பட்ட அளவுகோலில் தன் வலியின் அளவினை குறியிட்டு காட்டுவார்.

APPENDIX J

STRUCTURED INTERVIEW QUESTIONNAIRE (ENGLISH)

Section A:

Data on Demographic variables of hemodialysis patients:-

1. Age:
    a. 20-30
    b. 31-40
    c. 41-50
    d. 51- 60
    e. Above 60
2. Gender:
    a. Male
    b. Female
3. Education:
    a. No formal
    b. Primary education
    c. Secondary education
    d. Graduation
4. Occupation:
    a. Govt.employee
    b. Self employee
    c. Unemployee
5. Monthly income:
    a. Rs. 5000-10000
    b. Rs. 10001-15000

c. Rs. 15001-20000
d. Rs. >20000

Section B:

Data on Clinical variables of hemodialysis patients:

1. Duration of dialysis:
    a. 1 yrs – 3 yrs
    b. 4 yrs – 6 yrs
    c. Above 7 yrs.
2. Frequency of dialysis:
    a. Once a week
    b. Twice a week
    c. Thrice a week
3. Types of access:
    a. Jugular fistula
    b. AV fistula
4. Potassium:
    - Below 3.5 mEq/l
    - Normal
    - Above 4.5 mEq/l
5. Urea:
    - Below 10 mEq/l
    - Normal
    - Above 50 mEq/l
6. Creatinine:
    - Below 0.5 mg/l
    - Normal
    - Above 1.5mg/l
    -

Section C:

Modified Brief pain inventory scale

Date: _____ Name: _____

1. Please rate your pain by circling the one number that best describes your pain at its worst in the last dialysis.

0	1	2	3	4	5	6	7	8	9	10
No pain	Mild pain			Moderate			Severe			Pain as bad

2. Please rate your pain by circling the one number that tells how much pain you have right now.

0	1	2	3	4	5	6	7	8	9	10
No pain	Mild pain			Moderate			Severe		Pain as bad	

3 . Circle the one number that describes how, during the past week, pain has interfered with your:

a. General activity

0	1	2	3	4	5	6	7	8	9	10

b. Mood

0	1	2	3	4	5	6	7	8	9	10

c. Walking ability

0 1 2 3 4 5 6 7 8 9 10

d. Normal work (includes both outside the home and housework)

0 1 2 3 4 5 6 7 8 9 10

e. Relations with other people

0 1 2 3 4 5 6 7 8 9 10

f. Sleep

0 1 2 3 4 5 6 7 8 9 10

g. Enjoyment of life

0 1 2 3 4 5 6 7 8 9 10

APPENDIX K

STRUCTURED INTERVIEW QUESTIONNAIRE (TAMIL)

தனிப்பட்ட விபரம்

பகுதி – I

1. வயது (வருடத்தில்)

    1) 21-30
    2) 31-40
    3) 41-50
    4) 51-61
    5) 60 மற்றும் அதற்கு மேல்

2. பாலினம்

    1) ஆண்
    2) பெண்

3. கல்வித் தகுதி

    1) படிப்பறிவில்லாதவர்
    2) ஆரம்பநிலைக் கல்வி
    3) உயர் நிலைக் கல்வி
    4) பட்டப்படிப்பு

4. தொழில் வகை

1) அரசு வேலை
2) சுய தொழில் செய்பவர்
3) வேலையில்லாதவர்

5. மாத வருமானம்

1) ரூ. 5000 – 10000 க்கும் குறைவாக
2) ரூ. 10000 – 15000
3) ரூ. 15000 – 20000
4) ரூ. 20000 க்கும் மேல்

1. எத்தனை வருடமாக டயாலிசிஸ் செய்கிறீர்கள் ?

1). 1 – 3 வருடம்
2). 4 – 6 வருடம்
3). 7 வருடத்திற்கு மேல்

2. வாரத்திற்கு எத்தனை முறை டயாலிசிஸ் செய்வீர்கள் ?

1). ஒரு முறை

2). இரண்டு முறை

3). மூன்று முறை

3. அனுகல் வகைகள் குறிப்பிடுக

1). கழுத்துச் ∴பிஸ்டுலா
2). ஏ.வி. ∴பிஸ்டுலா

4. இரத்தத்தில் பொட்டாசியம் அளவு

1). 3.5meq/L குறைவாக உள்ளது.

2). சுாதாரணமான

3). 4.5meq/L அதிகமாக உள்ளுத

5. இரத்தத்தில் யூரியா அளவு

1). 10 meq/L குறைவானது

2). சாதாரணமான

3). 50 meq/L அதிகமானது

6. இரத்தத்தில் கிரியாட்டினின் அளவு

1). 0.5 meq/L குறைவானது

2). சாதாரணமான

3). 1.5 meq/L அதிகமானது

பகுதி – III

1. கடந்த 24 மணிநேரத்தில் மிக மோசமான உங்கள் வலியை விவரிக்க அதை எண்களில் வட்டமிட்டு காட்டவும்.

0 1 2 3 4 5 6 7 8 9 10

2. தற்பொழுது உங்கள் வலி எவ்வளவு இருக்கிறதோ, அதை எண்களில் வட்டமிட்டு காட்டவும்

0 1 2 3 4 5 6 7 8 9 10

3. கடந்த 24 மணிநேரத்திற்குள் உங்கள் வலி உங்களுடைய

அ). பொது நடவடிக்கை எவ்வாறு பாதித்துள்ளது ?

0 1 2 3 4 5 6 7 8 9 10

ஆ). மன நிலை

0 1 2 3 4 5 6 7 8 9 10

இ). நடைப்பயிற்சி திறன் :

0 1 2 3 4 5 6 7 8 9 10

ஈ). சாதாரண வேலை : (வெளி வேலை மற்றும் வீட்டு வேலை உட்பட)

0 1 2 3 4 5 6 7 8 9 10

உ). மற்றவர்களிடம் உங்கள் நடவடிக்கை எப்படி இருக்கிறது :

0 1 2 3 4 5 6 7 8 9 10

ஊ) தூக்கம் :

0 1 2 3 4 5 6 7 8 9 10

எ). இன்பமான வாழ்க்கை:

0 1 2 3 4 5 6 7 8 9 10

APPENDIX L

INTERVENTION MODULE FOR INTRADIALYTIC STRETCHING EXERCISE PROCEDURE

Introduction:

The muscles and tendons of our body benefit the most from stretching exercises. Stretching is the easiest way to relax the body and to return elasticity to the muscles and tendons which very often are shortened because of the exessive efforts the sportsman does. Stretching is an excellent way of preparing the locomotor system for muscular efforts: they improve the movement capacity by increasing the muscular elasticity and they help sooth the tiredness produced after an excessive training.

Definition:

Stretching is a form of physical exercise in which a specific muscle or tendon (or muscle group) is deliberately flexed or stretched in order to improve the muscle's felt elasticity and achieve comfortable muscle tone. The result is a feeling of increased muscle control, flexibility, and range of motion. Stretching is also used therapeutically to alleviate cramps.

Purposes:

- It deliberates release and contraction of a muscle or muscle group to increase elasticity and build strength.
- Release of tension, soreness and stiffness
- Reduces the risk for injury and enhances mental and physical relaxation.
- Preventing muscle strains and tears
- Helps to maintain strong balance and supports a more active lifestyle

Contraindications

- Joint Instability
- Acute Injury
- Vascular injury
- Infection
- Excessive Pain When Stretching
- Inflammation or Joint Effusion

Duration of intradialytic stretching exercise:

60 times for 10 minutes

Preparation of the patient:

- Make the patient comfortable
- Provide privacy
- Explain the procedure to the patient and get consent.

Procedure

Intervention	Rationale
• Explain the procedure to the patient • Provide privacy • Perform stretching exercise by increasing dorsiflexion of the ankle with knee slightly flexed and ankle extended and flexed for 60 times to contract and relaxes the gastrocnemius and soleus muscle. 	To gain co-operation To provide a sense of security To relieve muscle cramps.